THE
AMERICAN
YEAR BOOK

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THE AMERICAN YEAR BOOK

A RECORD OF EVENTS AND PROGRESS

1916

EDITED BY

FRANCIS G. WICKWARE, B. A., B. Sc.

WITH COÖPERATION OF A SUPERVISORY BOARD
REPRESENTING NATIONAL LEARNED SOCIETIES

OUTLOOK EDITION

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PREFACE

With the publication of this volume, covering the events and progress of 1916, the AMERICAN YEAR BOOK reaches its seventh issue. The YEAR BOOK for 1916 follows the lines of the issue for 1915, with the organization of the departments changed only in minor details, and the scope of the work remains as defined in the preface to the first issue:

"The AMERICAN YEAR BOOK is intended for the needs of writers and searchers of every kind. Because of its inclusion of scientific subjects, it has been necessary to limit the political and statistical material which is the staple of many annual handbooks; the book does not aim to treat everything that could be useful, but throughout to select from the enormous mass of details those things which, in the judgment of experts in each field, are most significant, most permanent in value, most likely to answer the searchers' questions.

"The AMERICAN YEAR BOOK does not aim to be a rival of other annual publications, either foreign or domestic. Details as to elections, the *personnel* of state and municipal governments, political personalities, societies, and educational, literary, and scientific institutions have deliberately been reduced, in order to make room for material of a kind not found in most of the annuals. The AMERICAN YEAR BOOK appeals first of all to students in all fields, who wish a record of progress, not only in their own, but in other departments of human endeavor. It is intended, also, as a handbook for busy men, editors, contributors, professional men, teachers, scientific workers, engineers, practical and business men, who wish to verify or confirm points that arise in their minds; and to serve as a handy body of reference material settling questions of fact. Throughout the work the object has been to make the volume convenient for the user; hence the YEAR BOOK is arranged on a plan entirely unique in publications of this general character. It is intended to make reference easier by subdividing material into departments, by putting cognate subjects into close association, and by liberal cross-references, making it easy to turn at once to the discussions relating to any subject. A full and carefully analyzed index is also provided in order to open up all remote connections and relations of a topic. This arrangement by groups of affiliated subjects, instead of haphazard or alpha-

betical succession of topics, is more convenient, and at the same time mor scientific."

The Supervisory Board of representatives of national learned and scier tific societies, officially known as the American Year Book Corporation, continues actively to assist in the preparation of the YEAR BOOK. The members of this Board, which originally projected the work, remain individually responsible for the scope and content of the reviews of their respective fields; several are themselves contributors; many have coöperated with the Editor in securing contributors; and all have assisted the Editor with criticism and counsel. The Supervisory Board has now forty members, a complete list of whom will be found on a subsequent page, representing forty-four societies. No change in *personnel* has occurred during 1916.

One hundred and twenty-seven contributors have coöperated in the preparation of this issue. All are experts in their special fields, and the complete list printed on a subsequent page contains many names of eminence.

The war in Europe continues to dominate the record. The YEAR BOOK for 1915 gave an impressive exposition of its reaction on every aspect of American life; the pages of this volume reveal influences and effects no less amazing in diversity, and in some directions much more profound and permanent. In the Presidential campaign, the most important domestic event of the year, the war brought into prominence new issues of Americanism and preparedness. In national policy it was responsible for a striking increase in military and naval defense. In foreign relations not even the prospect of a warlike issue of the acute crisis with Mexico obscured the controversies of the United States with the European belligerents in defense of neutral rights. All the reactions of the war in America, political, economic and social, are discussed in this volume with fullness and authority, as are the military operations in the various theatres of war and the course of events in the warring countries. American events and progress in politics, economics, sociology, the sciences, the arts, and the humanities, are comprehensively reviewed, and are placed in their proper perspective by a background of the significant events in foreign countries.

The acknowledgments of the Editor are due, not only to the contributors and members of the Supervisory Board, but also to the many public officials, Federal, state, and municipal, who have courteously responded to requests for statistical and other data, and to the readers who have offered disinterested criticism of previous issues. The Editor welcomes criticism and suggestions from any source on the selection of material and method of treatment, or on the more formal side of typography, make-up, and conveniences for users.

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Caspar F. Goodrich, Rear-Admiral, U. S. N., retired. UNITED STATES NAVAL INSTITUTE.

Albert Bushnell Hart, Professor of Science of Government, Harvard University. AMERICAN HISTORICAL ASSOCIATION.

Hastings Hornell Hart, Sage Foundation, New York. NATIONAL CONFERENCE OF CHARITIES AND CORRECTION.

A. V. Williams Jackson, Professor of Indo-Iranian Languages, Columbia University. Secretary, AMERICAN ORIENTAL SOCIETY.

Emory R. Johnson, Professor of Commerce, University of Pennsylvania. AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.

George W. Kirchwey, late Professor of Law, Columbia University. AMERICAN INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY.

C. Grant La Farge, New York. AMERICAN INSTITUTE OF ARCHITECTS.

Alexander Lambert, Professor of Clinical Medicine, Cornell University. AMERICAN MEDICAL ASSOCIATION.

Waldo Lincoln, Worcester, Mass. President, AMERICAN ANTIQUARIAN SOCIETY.

George Grant MacCurdy, Professor of Archeology, Yale University. Secretary, AMERICAN ANTHROPOLOGICAL ASSOCIATION.

Samuel J. Meltzer, Rockefeller Institute, New York. AMERICAN PHYSIOLOGICAL SOCIETY.

George T. Moore, Professor of Applied Botany, Washington University. Secretary, BOTANICAL SOCIETY OF AMERICA.

Edward L. Nichols, Professor of Physics, Cornell University. AMERICAN PHYSICAL SOCIETY.

Calvin W. Rice, Secretary, AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

John C. Rolfe, Professor of Latin Languages and Literature, University of Pennsylvania. AMERICAN PHILOLOGICAL ASSOCIATION.

Henry N. Russell, Professor of Astronomy, Princeton University. AMERICAN ASTRONOMICAL SOCIETY.

Edwin R. A. Seligman, Professor of Political Economy and Finance, Columbia University. AMERICAN ECONOMIC ASSOCIATION.

Alexander Smith, Professor of Chemistry, Columbia University. AMERICAN CHEMICAL SOCIETY.

Bradley Stoughton, Consulting Engineer, New York. AMERICAN INSTITUTE OF MINING ENGINEERS (Secretary) and AMERICAN SOCIETY FOR TESTING MATERIALS.

Wendell M. Strong, New York. Secretary, ACTUARIAL SOCIETY OF AMERICA.

Walter F. Willcox, Professor of Economics and Statistics, Cornell University. AMERICAN STATISTICAL ASSOCIATION.

W. W. Willoughby, Professor of Political Science, Johns Hopkins University. AMERICAN POLITICAL SCIENCE ASSOCIATION.

Edwin B. Wilson, Professor of Mathematics, Massachusetts Institute of Technology. AMERICAN MATHEMATICAL SOCIETY.

George G. Wilson, Professor of International Law, Harvard University. AMERICAN SOCIETY OF INTERNATIONAL LAW.

Clinton Rogers Woodruff, Secretary, NATIONAL MUNICIPAL LEAGUE.

James I. Wyer, Jr., New York State Library, Albany. AMERICAN LIBRARY ASSOCIATION.

CONTRIBUTORS

Nathan Abbott, A.B., LL.B.: Law and Jurisprudence.
Professor of Law, Columbia University.

Cyrus C. Adams, A.B.: Exploration and Geographical Research.
Former Editor, *Bulletin of the American Geographical Society.*

Charles Hahn Albrecht, M.A., LL.B.: International Relations.
Consul of the United States, attached to the office of the Foreign Trade Adviser, Department of State.

Edwin West Allen, Ph.D.: Agriculture.
Chief, Office of Experiment Stations, U. S. Department of Agriculture; Editor, *Experiment Station Record;* Secretary, Agricultural Section, American Association for the Advancement of Science.

Carl Lucas Alsberg, A.M., M.D.: Biological and Food Chemistry.
Chief, Bureau of Chemistry, U. S. Department of Agriculture.

Andrew P. Anderson, B.S.: Highways.
Highway Engineer, Office of Public Roads and Rural Engineering, U. S. Department of Agriculture.

Irene Osgood Andrews, A.B.: Labor Legislation.
Assistant Secretary, American Association for Labor Legislation.

John Bertram Andrews, A.M., Ph.D.: Labor; Unemployment.
Secretary, American Association for Labor Legislation; Editor, *American Labor Legislation Review.*

Joseph A. Anglada, M.E.: Automobiles.
Consulting Mechanical Engineer.

Wallace Walter Atwood, B.S., Ph.D.: Physical Geography.
Professor of Physiography, Harvard University; Geologist, U. S. Geological Survey.

Leonard S. Austin, Ph.B.: Copper.
Consulting Mining and Metallurgical Engineer.

William Nickerson Bates, A.M., Ph.D.: Classical Archæology.
Professor of Greek, University of Pennsylvania; Editor, Department of "News and Discussions," *American Journal of Archæology.*

Albert Croll Baugh, Ph.D.: English Literature.
Instructor in English, University of Pennsylvania.

Morris Bien, Ph.B., LL.M.: Public Lands.
Supervising Engineer and Counsel, U. S. Reclamation Service.

Francke Huntington Bosworth, Jr., A.B.: Architecture.
Architect.

Benjamin P. Bourland, A.M., Ph.D.: Romance Languages and Literature.
Professor of the Romance Languages, Western Reserve University.

Harlow Brooks, M.D.: Medicine.
Professor of Clinical Medicine, New York University.

Arthur Wesley Browne, M.S., Ph.D.: Inorganic and Physical Chemistry.
Professor of Inorganic and Analytical Chemistry, Cornell University.

Henry King Carroll, LL.D.: Christian Churches.
Associate Secretary, Federal Council of Churches of Christ in America.

Mary Chamberlain, A.B.: CONSTRUCTIVE AND PREVENTIVE SOCIAL WORK.
Member Editorial Staff of *The Survey.*

Emile M. Chamot, Ph.D., B.Sc.Chem.: SANITARY CHEMISTRY.
Professor of Chemical Microscopy and Sanitary Chemistry, Cornell University.

Daniel H. Cox: NAVAL ARCHITECTURE AND MARINE ENGINEERING.
Graduate, U. S. Naval Academy and Royal Naval College, Greenwich, England; Secretary, American Society of Naval Architects and Marine Engineers.

William Thomas Cross, A.M.: CHARITY.
General Secretary, National Conference of Charities and Correction.

Arthur Davis Dean, B.S., D.Sc.: VOCATIONAL EDUCATION AND GUIDANCE.
Director of Agricultural and Industrial Education, New York State Department of Education.

Walter Dennison, Ph.D.: EPIGRAPHY.
Professor of Latin and Greek, Swarthmore College.

Raymond Smith Dugan, M.A., Ph.D.: ASTRONOMY.
Assistant Professor of Astronomy, Princeton University.

Benjamin Minge Duggar, M.S., A.M., Ph.D.: BOTANY.
Professor of Plant Physiology, Washington University; Physiologist to the Missouri Botanical Garden.

Charles Rochester Eastman, A.M., Ph.D.: PALEONTOLOGY.
Associate Curator in Paleontology, American Museum of Natural History; Editor, Paleontological Society of America.

Walter Prichard Eaton, A.B.: THE DRAMA.
Dramatic Critic, *American Magazine.*

John Warren Edgerton, M.A., LL.B.: CRIMINAL LAW.
Professor of Criminal and Commercial Law, Yale University.

Walter H. Evans, A.M., Ph.D.: DISEASES OF PLANTS.
Botanical Editor, *Experiment Station Record;* Chief of Insular Stations, Office of Experiment Stations, U. S. Department of Agriculture.

Charles De Van Fawcett, E.E.: ELECTRICAL ENGINEERING.
Assistant Secretary, Illuminating Engineering Society.

James Ford, Ph.D.: COÖPERATION.
Assistant Professor of Social Ethics, Harvard University.

Edwin J. Glasson, B.S.A.: HORTICULTURE; FORESTRY.
Horticulture and Forestry Editor, *Experiment Station Record,* U. S. Department of Agriculture.

Ernest Henry Godfrey, F.S.S.: CANADA.
Editor, Census and Statistics Office, Ottawa, Canada.

Leon Goldmerstein, M.A.: MECHANICAL ENGINEERING.
Editor, "Engineering Survey," *Journal of the American Society of Mechanical Engineers.*

Selskar Michael Gunn, S.B.: PUBLIC HEALTH AND HYGIENE.
Associate Professor of Sanitary Biology and Public Health, Massachusetts Institute of Technology; Secretary, American Public Health Association; Editor, *American Journal of Public Health.*

Edward Everett Hale, A.B., Ph.D.: AMERICAN LITERATURE.
Professor of English, Union College.

Robert Dawson Hall: COAL, COKE, AND PETROLEUM.
Associate Editor, *Coal Age.*

Lee Franklin Hanmer, Ph.B.: RECREATION.
Director, Department of Recreation, Russell Sage Foundation.

Fred Geer Harden, M.A.: RECLAMATION.
Irrigation Engineer, Office of Public Roads and Rural Engineering, U. S. Department of Agriculture.

Richard Compton Harrison, A.M., LL.B.: PUBLIC SERVICES.
Formerly Assistant Counsel, Public Service Commission, First District of New York; Deputy Commissioner of Docks, New York.

Herman A. Haubold, M.D.: SURGERY.
Clinical Professor of Surgery, New York University.

Daniel Lyman Hazard, A.B.: TERRESTRIAL MAGNETISM.
Assistant Chief, Division of Terrestrial Magnetism, U. S. Coast and Geodetic Survey.

William Arthur Heidel, Ph.D.: GREEK LITERATURE.
Professor of Greek, Wesleyan University.

Roscoe R. Hill, A.B.: LATIN AMERICA.
Associate Professor of History, University of New Mexico.

Heinrich O. Hofman, E.M., Met. E., Ph.D.: LEAD.
Professor of Metallurgy, Massachusetts Institute of Technology and Harvard University.

Arthur Norman Holcombe, Ph.D.: POPULAR GOVERNMENT.
Assistant Professor of Government, Harvard University.

William A. Hooker, B.S., D.V.M.: ECONOMIC ENTOMOLOGY; VETERINARY MEDICINE.
Editor for Economic Entomology and Veterinary Medicine, *Experiment Station Record*, U. S. Department of Agriculture.

William Otis Hotchkiss, C.E., Ph.D.: STATE GEOLOGICAL SURVEYS.
State Geologist of Wisconsin; Secretary, Association of American State Geologists.

G. Carl Huber, M.D.: ANATOMY.
Professor of Anatomy and Director of Anatomic Laboratories, University of Michigan.

Grover G. Huebner, Ph.D.: TRADE, TRANSPORTATION, AND COMMUNICATION.
Assistant Professor of Transportation and Commerce, University of Pennsylvania.

Solomon S. Huebner, Ph.D.: ECONOMIC CONDITIONS AND THE CONDUCT OF BUSINESS; PROPERTY AND CASUALTY INSURANCE.
Professor of Insurance and Commerce, University of Pennsylvania; Special Lecturer at Columbia and New York Universities.

Jerome Clarke Hunsaker, S.M., Eng.D.: AERONAUTICS.
Assistant Naval Constructor, U. S. Navy.

Walter Renton Ingalls, S.B.: ZINC.
Editor, *Engineering and Mining Journal.*

Abram S. Isaacs, A.M., Ph.D.: JUDAISM.
Professor of Semitic Languages, New York University.

Morris Jastrow, Jr., Ph.D.: SEMITIC PHILOLOGY AND LITERATURE.
Professor of Semitic Languages, University of Pennsylvania.

Wolfgang L. G. Joerg: CARTOGRAPHY.
Assistant Editor, *Bulletin of the American Geographical Society.*

Joseph Esrey Johnson, Jr., M.E., M.M.E.: IRON AND STEEL.
Consulting Engineer and Metallurgist.

Roland G. Kent, A.M., Ph.D.: INDO-EUROPEAN PHILOLOGY.
Professor of Comparative Philology, University of Pennsylvania.

Philip Klein, A.B.: CRIMINOLOGY AND PENOLOGY.
Assistant Secretary, Prison Association of New York; sometime Fellow, New York School of Philanthropy.

Charles Knapp, A.M., Ph.D.: Latin Literature.
Professor of Classical Philology, Columbia University; Managing Editor, *The Classical Weekly.*

Howard L. Knight, B.S.: Agricultural Legislation.
Assistant Editor, *Experiment Station Record,* U. S. Department of Agriculture.

Adolph Knopf, M.S., Ph.D.: Economic Geology.
Geologist, United States Geological Survey; Editor, *Journal of the Washington Academy of Sciences.*

John Koren, A.B., F.S.S., F.A.S.A.: The Liquor Problem.
Statistician and Author.

Alexander Lambert, M.D.: Medicine.
Professor of Clinical Medicine, Cornell University.

Herbert Sidney Langfeld, Ph.D.: Psychology.
Assistant Professor of Psychology, Harvard University.

George Washington Littlehales, C.E.: Oceanography.
Hydrographic Engineer, U. S. Hydrographic Office.

Charles E. Locke, S.B.: Mining and Ore Dressing.
Assistant Professor of Mining Engineering and Metallurgy, Massachusetts Institute of Technology.

Robert Bruce McBride: The Army.
Captain of Coast Artillery, U. S. Army; Assistant to the Quartermaster-General.

William Bernard M'Cormick: Painting, Sculpture, and Handicrafts.
Art Critic, New York *Evening Mail.*

George Grant MacCurdy, Ph.D.: Anthropology and Ethnology.
Assistant Professor of Prehistoric Archeology, Yale University.

James Stanislaus MacGregor, M.S.: Physical Properties of Metals and Alloys.
Instructor in Charge of Testing Laboratory, Columbia University.

Frank McIntyre: Territories and Dependencies.
Brigadier-General, U. S. Army; Chief, Bureau of Insular Affairs, U. S. War Department.

Frederick H. Martens: Music.
Music journalist and critic; on staff of the *Musical Observer;* New York correspondent of the *London Musical Record.*

Alexander Martin: The European War.
A military officer with a record of naval service who for professional reasons writes pseudonymously.

John Mabry Mathews, A.B., Ph.D.: State and County Government.
Assistant Professor of Political Science, University of Illinois.

Herbert Ashton Megraw, B.S.: Gold and Silver.
Editorial Staff, *Engineering and Mining Journal.*

Samuel James Meltzer, M.D., LL.D.: Physiology and Pharmacology.
Head of the Department of Physiology and Pharmacology, Rockefeller Institute for Medical Research.

Charles Elwood Mendenhall, B.S., Ph.D.: Physics.
Professor of Physics, University of Wisconsin.

Wesley Clair Mitchell, A.B., Ph.D.: Economics.
Professor of Economics, Columbia University.

Parker Thomas Moon, B.S.: Continental Europe and Asia.
Instructor in European History, Columbia University.

Clifford Herschel Moore, Ph.D., Litt.D.: Ancient Literature.
Professor of Latin, Harvard University.

Milton Donaldson Moore, A.B.: DAIRYING.
Dairy Editor, *Experiment Station Record*, U. S. Department of Agriculture.

John Nolen, Ph.B., A.M., Sc.D.: LANDSCAPE ARCHITECTURE.
Landscape Architect and City Planner.

Ralph Barton Perry, A.M., Ph.D.: PHILOSOPHY.
Professor of Philosophy, Harvard University.

Edward Porritt: THE BRITISH EMPIRE.
Journalist and author, American correspondent of the London *Times*, Manchester *Guardian*, and other British newspapers.

Harry Fielding Reid, C.E., Ph.D.: EARTHQUAKES AND VOLCANOES.
Professor of Dynamical Geology and Geography, Johns Hopkins University; Special Expert in Charge of Earthquake Records, U. S. Geological Survey.

Calvin Winsor Rice, S.B.: MECHANICAL ENGINEERING.
Secretary, American Society of Mechanical Engineers.

Robert Riegel, A.M.: TRADE, TRANSPORTATION, AND COMMUNICATION.
Instructor in Insurance and Commerce, University of Pennsylvania.

Walter F. Rogers, LL.M.: PATENTS AND INVENTION.
Member of the New York and Washington Bars.

George McCullough Rommel, B.S., B.S.A.: LIVE STOCK.
Chief, Animal Husbandry Division, Bureau of Animal Industry, U. S. Department of Agriculture.

William Horace Ross, M.Sc., Ph.D.: AGRICULTURAL CHEMISTRY.
Scientist in Soil Investigations, Bureau of Soils, U. S. Department of Agriculture.

Gar A. Roush, A.B., M.S.: ELECTROCHEMISTRY.
Assistant Professor of Metallurgy, Lehigh University; Assistant Secretary, American Electrochemical Society; Editor, *The Mineral Industry*.

Edward McChesney Sait, M.A., Ph.D.: CONGRESS AND ADMINISTRATION.
Assistant Professor of Politics, Columbia University.

Thomas William Salmon, M.D.: MENTAL HYGIENE.
Medical Director, National Committee for Mental Hygiene.

Herbert Newhard Shenton, A.M., B.D.: SOCIOLOGY.
Instructor in Sociology, Columbia University.

Daniel Bussier Shumway, B.S., Ph.D.: GERMANIC LANGUAGES AND LITERATURE.
Professor of Germanic Philology, University of Pennsylvania.

Anna Tolman Smith: EDUCATION AND EDUCATIONAL INSTITUTIONS.
Specialist, U. S. Bureau of Education.

George Otis Smith, Ph.D.: U. S. GEOLOGICAL SURVEY.
Director, U. S. Geological Survey.

Hugh McCormick Smith, M.D., LL.D.: FISHERIES.
Commissioner, U. S. Bureau of Fisheries.

William Freeman Snow, M.A., M.D.: SOCIAL HYGIENE.
General Secretary, American Social Hygiene Association.

William M. Steuart, LL.B., LL.M.: MANUFACTURES.
Chief Statistician for Manufactures, U. S. Census Bureau.

George David Stewart, M.D.: SURGERY.
Professor of Surgery, New York University.

Wendell M. Strong, M.A., Ph.D., LL.B.: LIFE INSURANCE.
Associate Actuary, Mutual Life Insurance Company, New York; Secretary, Actuarial Society of America.

David H. Tennent, Ph.D.: Zoölogy.
Professor of Biology, Bryn Mawr College.

Carl Dean Thompson, M.A., B.D.: Socialism.
Secretary, National Public Ownership League.

Laura A. Thompson, A.B: Child Welfare.
Librarian, Children's Bureau, U. S. Department of Labor.

John Bishop Tingle, Ph.D., F.C.S.: Organic Chemistry.
Professor of Chemistry, McMaster University, Toronto, Canada.

William Lawrence Tower, Sc.B.: Organic Evolution.
Associate Professor of Zoölogy, University of Chicago.

James Libby Tryon, A.B., B.D., LL.B., Ph.D.: Peace and Arbitration.
Director, New England Department, American Peace Society; Member of the Maine Bar.

Thurman William Van Metre, A.M., Ph.D.: Waterways and Harbors.
Instructor in Transportation, Columbia University.

Robert DeCourcy Ward, A.M.: Meteorology and Climatology.
Professor of Climatology, Harvard University.

Frank Julian Warne, M.A., Ph.D.: Immigration.
Professional Expert on Railway Economics; Special Expert on Foreign-born Population, Thirteenth Census.

Ray Bert Westerfield, Ph.D.: Banking and Currency.
Assistant Professor of Political Economy, Yale University.

Herbert Percy Whitlock, C.E.: Mineralogy and Petrography.
State Mineralogist and Curator of Minerals, New York State Museum.

Francis Graham Wickware, B.A., B.Sc.: National Administration; Chronology and Necrology; Miscellaneous.
Managing Editor, The American Year Book.

Frank Clinton Wight, C.E.: Civil Engineering.
Managing Editor, *Engineering News.*

Charles Clarence Williamson, A.B., Ph.D.: Public Finance.
Librarian, Municipal Reference Library, New York City.

Edwin Bidwell Wilson, Ph.D.: Mathematics.
Professor of Mathematics, Massachusetts Institute of Technology.

James Renwick Withrow, B.S., Ph.D.: Industrial Chemistry and Chemical Engineering.
Professor of Industrial Chemistry, Ohio State University; Consulting Chemical Engineer.

Martha Wollstein, M.D.: Pathology and Bacteriology.
Associate of the Rockefeller Institute for Medical Research; Pathologist to the Babies' Hospital, New York.

James Albert Woodburn, A.M., Ph.D., LL.D.: Politics and Parties.
Professor of American History and Politics, Indiana University.

Clinton Rogers Woodruff, Ph.B., LL.B.: Civil Service; Municipal Government; Social Work of the Churches.
Secretary, National Municipal League; Editor, *National Municipal Review.*

Jay Backus Woodworth, B.S.: Dynamical and Structural Geology.
Associate Professor of Geology, Harvard University.

Dean A. Worcester, A.B.: Latin America.
Professor of Psychology and Philosophy, University of New Mexico.

James Ingersoll Wyer, Jr., M.L.S.: Libraries.
Director, New York State Library.

THE AMERICAN YEAR BOOK

A RECORD OF EVENTS AND PROGRESS

I. AMERICAN HISTORY

CONGRESS AND ADMINISTRATION

EDWARD M. SAIT

Legislative and Administrative Tendencies.—In several respects the first session of the Sixty-fourth Congress, which began on Dec. 6, 1915, and ended on Sept. 8, was very remarkable. In dealing with the problems of national defense, Congress went far beyond the recommendations which the President had laid before it. Army reorganization, the enormous appropriations made for naval and military purposes, and the new taxes devised to meet these expenditures, easily assumed the place of first importance in the work of the session. But aside from these, the legislation ranged over a wide field and touched the economic interests of the country at many points. The Democrats, in passing the Child Labor Act and in establishing an eight-hour day for certain classes of railroad employees, committed themselves to an extreme assertion of Federal authority. Not less significant was the disposition shown to expand Government activity in the domain of industry and commerce, this being exemplified by the provision made for the manufacture of armor plate and naval projectiles, for the extraction of nitrates from the air by hydroelectric power, for the enlargement of the existing gunpowder plant, for the equipment of navy yards with facilities for the construction of capital ships, and for Government participation in the shipping business. The multiplication of administrative commissions, which had begun with the establishment of the Federal Reserve Board in 1913 and the Federal Trade Commission in 1914, was another feature of the session. Congress erected a Shipping Board of five members, a Farm Loan Board of five, a Tariff Commission of six, and an Employees' Compensation Commission of three.

Executive influence has never been more dominant in national legislation. Various circumstances played into the President's hands—the desire of his party to face the Presidential election with a commanding record of achievement, and still more the natural ascendancy of the Executive in a time of serious international complications.

THE SIXTY-FOURTH CONGRESS, FIRST SESSION

The President's Message.—In his annual message of Dec. 7, 1915, President Wilson recommended a fairly definite scheme of legislation. He advocated:

(1) Substantial increase in national defense, a regular army of 142,000 and a force of 400,000 "disciplined citizens"; a five-year programme for the Navy requiring two battleships and two battle cruisers the first year; and the creation of an advisory council to provide for the mobilization of economic resources in time of national necessity.

(2) Financial legislation to meet the heavy expenditures thus entailed.

(3) The enactment, with some modifications, of the Ship Purchase bill which had failed of adoption in 1915.
(4) The enactment of the bills reorganizing the governments of Porto Rico and the Philippines.
(5) Federal aid for vocational education.
(6) A system of rural credits for the encouragement of agriculture.
(7) The opening up of natural resources for development under proper safeguards.
(8) The appointment of a commission to inquire into the whole subject of interstate railroad transportation.

Further recommendations were made during the course of the session. The President urged Democratic leaders in both houses to secure the passage of bills erecting a permanent Tariff Commission, prohibiting the interstate shipment of the products of child labor, and providing compensation for workmen injured in the Federal service. Finally, on Aug. 29, when a great strike of railroad employees seemed imminent, he appeared before Congress and asked immediate legislation granting the eight-hour day which the men demanded.

Final action was taken, though not always in rigid conformity with the President's ideas, on almost all of these proposals; only the measures relating to natural resources, vocational education, and the government of Porto Rico failed to pass both houses. In view of the desire for an early adjournment, executive pressure alone prevented the abandonment of other measures. The force of that pressure was demonstrated when Congress reluctantly passed the Child Labor bill and the Adamson Eight-Hour bill, when it abandoned its evident intention of interfering in the adjustment of the armed-merchantmen question, and when the House acquiesced in the Senate's larger view of naval and military requirements. In his relations with the House the President was somewhat embarrassed by the attitude of the new Democratic floor leader; for Mr. Kitchin (N. C.), far from encouraging the party to support the Administration programme, expressed open disapproval of the bills which provided for national defense and the Tariff Commission. He said of the General Revenue bill, when himself reporting it from the Committee of Ways and Means, that it contained "too much Republicanism for an old-line Democrat."

The legislative record of the session in acts of public interest was unusually large. A complete list of the important measures of general interest is given elsewhere (see V, *The National Administration*), and most of them are discussed in more or less detail in the articles dealing with the subjects to which they relate. This following review of the proceedings of Congress deals only with those measures and events of distinct political significance.

The National Defense Act.—The first aspect of national defense to occupy the attention of Congress was reorganization of the Army. Committee hearings which began early in January canvassed the whole subject with exceptional thoroughness. Technical experts, while disagreeing in matters of detail, united in urging a substantial and immediate increase of the military establishment. The chief questions which had to be considered were the strength of the Regular Army and the nature of the force which must be created to supplement it; on the second point choice lay between the "continental army" proposed by the President and Secretary of War Garrison, and a federalized National Guard. General Scott, the Chief of Staff, and General Bliss gave unqualified endorsement to Mr. Garrison's plan. But the National Guard Association, condemning this plan as impracticable, advocated federalization of the Guard and presented to the committees of both houses a bill which provided Federal pay for the militia, qualifying examinations for officers, a minimum of 48 drills a year, and war service within and without the United States. So persistent was the lobby maintained at Washington by the Association that Senator Chamberlain, chairman of the Committee on Military Affairs, and several of his colleagues denounced it in vigorous terms.

The House bill was introduced by Mr. Hay (Va.) on March 6. It provided for a Regular Army of 143,000, a federalized National Guard which would reach a strength of over 400,000 in five years, and civilian training camps expected to develop an additional force of 100,000. Notwith-

standing the abandonment of the "continental army" plan, which had led Secretary Garrison to resign (see *The Administration, infra*), President Wilson intimated that he was fully satisfied with the bill. Prompt consideration was ensured by a special rule which the House adopted on May 16. On final passage, just a week later, the vote was 402 to 2, the minority of two being a Socialist, who opposed preparedness in any form, and a Republican who demanded more effective preparedness. But while the House so readily accepted the bill as a whole, a formidable minority regarded the provision for the Regular Army as inadequate, and a proposal to fix the establishment at 220,000 men was defeated by a slender majority of 22 (213 to 191), 33 Democrats supporting and 34 Republicans opposing it.

The Senate bill was reported by Mr. Chamberlain (Ore.) on March 17. It provided for a Regular Army with a peace strength of 178,000; a federalized National Guard of 250,000; and a Federal volunteer force of 261,000 to be trained for a month each year in summer camps, the President being empowered to settle details as to enlistment, training, reserve, etc. The relative merits of the National Guard and the volunteers took the most prominent place as a theme of discussion. Leading Senators of both parties expressed doubts as to whether the organized militia could ever become an efficient fighting force; and Senator Borah of Idaho declared that, under the Constitution, it would be impossible for the Federal Government to assert an effective control over the militia. But eventually the Senate decided to accept the provisions of the bill as to both the National Guard and the volunteers. Twice it rejected a motion proposing to eliminate the volunteer force, first by a vote of 36 to 34 (19 Democrats supporting the motion, 24 opposing it), and afterwards by a vote of 40 to 37. In the closing hours of the debate an amendment was carried (43 to 37) increasing the peace strength of the Regular Army to 250,000 men, the majority comprising 22 Republicans and 21 Democrats. The Senate adopted two other important amendments: one for the construction of a nitrate plant costing $15,000,000; the other for the establishment of a school and college reserve corps. The bill passed on April 18 without a roll call.

The differences between the two houses proved difficult to adjust in conference. On May 5 Mr. Hay announced a deadlock on three points: the size of the Regular Army, the volunteer plan, and the nitrate plant. But ten days later a final agreement was reached, this being accepted by the Senate on May 17 and by the House on May 20 (the vote being 349 to 25). The details of the National Defense Act, which was signed by the President on June 3, will be found elsewhere (see XII, *The Army*). It authorizes a regular army of about 186,000 officers and men; a federalized National Guard which will gradually reach a peace strength of over 425,000 men; a system of civilian training camps; a system of military training for schools and colleges; and the construction of Government plants, at a maximum cost of $20,000,000, for the production of nitrates and other products used in the manufacture of munitions and fertilizers.

The Army Appropriation Act.—The enlargement of the military forces, as prescribed in the National Defense Act, entailed heavy expenditures. As reported to the House on June 16 the Army Appropriation bill carried $157,123,000, which exceeded the supply appropriated for the previous fiscal year by more than $55,000,000. It passed the House a week later without a roll call. While few changes had been made in the original dispositions of the bill, the exigencies of the Mexican situation had necessitated an increase of about $25,000,000. But this increase was altogether inadequate to cover the cost of equipping the National Guard, transporting it to the border, and maintaining it there; and mainly because of this circumstance the Senate, which passed the bill without a roll call on July 27, agreed upon an aggregate sum of nearly $314,000,000. In conference this amount was reduced to $267,596,530. Aside from the appropriations the bill contained several important features. It authorized the Presi-

dent, in time of war or the imminence of war, to assume control of transportation systems and to utilize them for military purposes. It established a Council of National Defense composed of six members of the Cabinet and designed to coördinate the industrial resources and transportation facilities of the country in the interests of national security, the Council to be assisted by an advisory commission of experts serving without pay. It also revised the Articles of War, which, remaining unchanged for a century, had become archaic. During conference Mr. Hay secured the adoption of an amendment to these revised Articles, which exempted officers and men on the retired list from the military criminal code. Notwithstanding urgent representations made by the Secretary of War, the conferees refused to reconsider their action, and on Aug. 18 President Wilson vetoed the bill, on the ground that:

> So long as Congress sees fit to make the retired personnel a part of the Army of the United States, the constitutionality of the proposed exemption of such personnel from all responsibility under the Articles of War is a matter of serious doubt, leaving the President, as it does, without any means sanctioned by statute of exercising over the personnel thus exempted the power of command vested in him by the Constitution.

He was also convinced "of its baneful effect upon the discipline of the Army." Mr. Hay at once reintroduced the bill, eliminating not only the clause which the President had condemned, but also the whole section relative to the Articles of War which the President had expressly approved. It passed the House on Aug. 22; but three days later, conforming with the action of the Senate, the House reinserted the Articles of War without the objectionable clause, and the President signed the Act on Aug. 29. (See also XII, *The Army.*)

The Naval Appropriation Act.—The sentiment in favor of national preparedness, which found expression in the army bills, was evidenced still more notably in the case of the Navy. The credit for this belongs mainly to the Senate. Although the House finally sanctioned a building programme which went beyond the most sanguine expectations, it refused at first to sanction the proposals put forward by the President. These proposals contemplated a five-year building programme, with two battleships, two battle cruisers, three scout cruisers, 15 destroyers, five fleet submarines, and 25 coast submarines for the fiscal year 1917 (*A. Y. B.*, 1915, p. 324). The House Committee on Naval Affairs not only abandoned the principle of a continuing programme, but refused to accept the recommendations for 1917. It provided for the construction of five battle cruisers, four scout cruisers, three fleet submarines, 17 coast submarines, and 10 destroyers, this decision being reached by a party vote of 13 to 8, with the Republican minority squarely committed to a more ambitious plan. The bill, as reported to the House on May 24, carried appropriations aggregating $241,449,151, and Secretary of the Navy Daniels, whose recommendations had been slighted, curiously enough expressed his approval. Chairman Padgett (Tenn.), in explaining the bill, said that while the Navy must continue to place its chief reliance in battleships, the immediate and pressing necessity was to provide it with swift battle cruisers. The Republicans on May 30 supported amendments which called for two battleships, six battle cruisers, six scout cruisers, 28 destroyers, and 50 submarines. The battleship amendment was defeated 130 to 114; the battle-cruiser amendment by 109 to 83; but with the assistance of some 20 Democrats the submarine amendment was adopted by 114 to 104. Three days later the Republicans nearly succeeded in having the bill sent back to committee and remodelled according to their views. The close vote (189 to 183) indicated a significant shift of opinion; 25 Democrats, mostly from New York, New Jersey, and Massachusetts, voted with the minority.

Another subject of controversy was the proposed Government plant for the manufacture of armor plate. A separate bill authorizing the construction of such a plant at a cost of $11,000,000 had been passed by the Senate on March 21 and favorably reported to the House on April 5. Private manufacturers made every effort to defeat the bill; one company even

offering to supply the Government at a price based upon the cost of production and determined by impartial arbitrators. On May 31 the armor-plate bill was incorporated in the naval bill; and when the Republican leaders, wishing to leave the way open to an understanding between the Government and private manufacturers, sought to have the provision struck out, they found the Democrats practically unanimous in its favor and their own followers divided. Forty-eight Republicans voted for the plant. Another amendment provided that certain navy yards should be equipped for the building of capital ships and that the Government should build any or all of the ships now authorized in case the terms offered by private contractors proved unsatisfactory. With these and other items added the appropriations reached $269,970,000. On June 2 the House passed the bill by a vote of 358 to 4.

The House bill, considered by the Senate Committee, was radically changed on June 22. With the members of both parties acting in agreement, it assumed the character of a new bill based upon the Administration's proposals. Indeed it provided for the first year three more capital ships than the President had recommended. Before reporting the bill to the Senate on June 30, the Committee made a still more radical change. The five-year programme, involving 157 new units and an expenditure of $588,180,000, was converted into a three-year programme. For the first year the bill authorized four battleships, four battle cruisers, four scout cruisers, 20 destroyers, and 30 submarines; it carried a grand total of $315,826,843, or more than twice the amount voted for 1916. Yet no formidable resistance was offered in the Senate. Three Republicans who afterwards voted for the bill (Cummins and Kenyon of Iowa and Townsend of Michigan) made various attempts to reduce the number of capital ships, as did two Democrats (Thomas and Shafroth of Colorado); but their motions commanded only insignificant support. The chief opposition came from a small group of radical or progressive Republicans, the most active of whom were Mr. Clapp (Minn.), Mr. La Follette (Wis.), and Mr. Norris (Neb.). The bill finally passed the Senate on July 21 by a vote of 71 to 8. The minority included two Democrats (Thomas of Colorado and Vardaman of Mississippi), the three Republicans named above, and three other Republicans (Curtis of Kansas, Gronna of North Dakota, and Works of California).

The bill remained in conference until Aug. 11. As no agreement had been reached on the building programme, that matter now came directly before the House. The President and Secretary Daniels, having come out squarely for the Senate bill, labored with the Democratic leaders. On Aug. 15, by a vote of 283 to 51, the House gave way. The minority included 35 Democrats, 15 Republicans, and one Socialist, the Democratic floor leader (Mr. Kitchin) being among the number. He condemned the President for shifting ground and complained that "the United States becomes to-day the most militaristic naval nation on earth." Agreement on the building programme was the vital point. Other questions raised no serious difficulty. On Aug. 18 both houses accepted the bill, the appropriations having been fixed at $313,300,555, and the President signed it on Aug. 29. (For details see XII, *The Navy.*)

Minor Defense Measures.—The Fortifications Appropriation Act provided $25,748,050, this sum representing an increase of more than $6,000,000 over 1916. An act of Feb. 15 enlarged the cadet corps at the Naval Academy; each member of Congress and territorial delegate is now permitted to name three cadets instead of two. An act of May 4 enlarged the cadet corps at the Military Academy, assigning two to each Congressional district, two to each territory, four to the District of Columbia, two to Porto Rico, four to each state at large, 80 to the United States at large, and 180 to the enlisted men of the National Guard.

The General Revenue Act.—Contemplating a deficit of $252,701,000 for the fiscal year 1917, the President recommended in his message the extension of the War Revenue Act of 1914, the retention of the sugar duty

of one cent a pound which would otherwise expire on May 1, 1916, the imposition of new internal taxes, and certain changes in the income tax (*A. Y. B.*, 1915, p. 73). By an act of Dec. 17 the War Revenue Act was extended to the end of 1916. A bill repealing the provision of the Underwood Tariff Act by which sugar would be admitted free of duty after May 1, 1916, passed the House on March 16 by a vote of 346 to 14. The Senate, following a decision of the Democratic caucus, amended the bill on April 11 so as merely to postpone the application of the Underwood provision for a period of four years. Ultimately, however, by a vote of 59 to 10, it accepted the House bill, which the President signed on April 27.

A General Revenue bill was favorably reported from the Ways and Means Committee of the House on July 5. Two Republicans, Gardner (Mass.) and Longworth (Ohio), voted with the Democratic majority; two others, Green (Iowa) and Sloan (Neb.), while opposing the favorable report, expressed intention of accepting the bill on final passage. Chairman Kitchin estimated the total appropriations for 1917 at $1,579,000,000, but $125,000,000 of this amount, having been required to meet the Mexican situation, should be financed by a bond issue. To meet an anticipated deficit of $266,922,000 it was proposed to levy new taxes yielding approximately $197,000,000 and to take $69,922,000 from the General Fund of the Treasury. The revenue bill provided for changes in the income tax, the existing exemption limit being retained, but the normal or basic rate increased from one to two per cent. and the surtax reclassified with rates running from one per cent. on incomes between $20,000 and $40,000 to 10 per cent. on incomes over $500,000; an inheritance tax with rates varying from one per cent. on estates of $50,000 or less to five per cent. on estates of more than $450,000; a munition manufacturer's tax of five to eight per cent. on gross receipts; certain miscellaneous taxes; protective duties for a limited period on the importation of dyestuffs (see XXIV, *Industrial Chemistry*); a Tariff Commission; and means of combating unfair competition on the part of foreign producers in American markets. This latter so-called anti-dumping clause imposed penalties in cases where imported commodities should be sold at a price substantially less than their price in the markets of the world with the cost of importation and sale added, the object of the low price being to prevent the establishment of a new American industry or to injure any existing industry or to restrain trade. It also imposed double duties on articles imported under a restrictive agreement binding any one to purchase, use, or deal in them exclusively.

The Tariff Commission, which did not find a place in the President's message, was advocated in a letter which he addressed to Mr. Kitchin on Jan. 24. He there outlined the proper functions of such a Commission, these embracing generally the operation of the customs tariff laws "in economic effect and administrative method." To some Democrats this letter seemed to imply a lack of faith in the Underwood Tariff; they accused the President of abandoning party principles. He answered his critics in a second letter. "I have changed my mind," he said, "because all the circumstances of the world have changed. . . . I have had in this change of mind no thought whatever of a change in mind toward the so-called protection question." The Commission would have nothing to do with theories or policy, but would deal only with the actual facts of industry and commerce.

As Mr. Kitchin had no sympathy with this proposal, the introduction of a Tariff Commission bill was entrusted to Mr. Rainey (Ill.). This bill provided for a commission of six members, no more than three of the same political party, to be appointed by the President and Senate for 12 years, one retiring every two years, and to be paid salaries of $10,000. After languishing for several months in the Ways and Means Committee, it came before the House as a part of the General Revenue bill. On July 10, after four days of debate, that comprehensive measure was passed without any fundamental change by a vote of 239 to 139, the majority including 39 Republicans and one Inde-

pendent. Among minor amendments was one which reduced the salaries of the commissioners to $7,500 and another which substituted for the permanent annual appropriation of $300,000 a single appropriation for the first year.

The House bill, after being revised by the Democratic members of the Senate Finance Committee, was subjected to further modification by the Democratic caucus and finally reported to the Senate on Aug. 16. The new features of the bill included: a surtax of 11 to 13 per cent. on incomes over $1,000,000; an increased inheritance tax of six to 10 per cent. on estates between $1,000,000 and $5,000,000; an increase of the munitions tax to 10 per cent. and its application at half that rate to materials used in producing munitions; a corporation stock license tax of 50 cents for each $1,000 of capital, surplus, and undivided profits above $99,000; the postponement of the tax on dyestuffs until after the war; and a clause empowering the President to place an embargo on the admission of articles from foreign countries when similar articles produced in the United States are not permitted to enter those countries. This clause was apparently directed against the action of the Entente Allies in excluding certain articles designated as luxuries during the period of the war.

During the course of the debates Mr. Underwood (Ala.) made persistent efforts to secure modifications in the bill. Declaring at the outset that he would not be bound by the decisions of the party caucus (it was technically termed a conference), he came into conflict with several Democratic leaders, particularly Mr. Stone (Mo.). "Of course," the latter remarked, "a demagogue cannot be dragooned. The position taken by the Senator from Alabama makes the Democratic caucus worse than useless." Mr. Underwood was especially opposed to what he termed "Republican tariff legislation"; but as only six Democrats joined him in his attack upon the dyestuffs duty, it was retained by a vote of 43 to 7; and the provision for a Tariff Commission was retained by a vote of 55 to 5. His effort to reduce the income-tax exemption (the caucus had refused to sanction such a change when proposed by the Democratic members of the Finance Committee) also failed; the vote was 31 to 19, the minority including five Democrats. The only important changes made by the Senate were in the nature of retaliatory measures directed against the Entente Allies (see also III, *International Relations*). The first of these provided that where a foreign belligerent, during the existence of a war in which the United States was not engaged, discriminated against any American products, the President should have power to prevent the importation of similar articles into the United States. A second clause empowered the President to refuse clearance papers to any belligerent merchantman refusing to carry American goods unless and only because of lack of cargo space, and imposed heavy penalties for any attempt to sail without such papers. A third clause empowered the President to refuse the use of the mails and of telephone, telegraph, wireless, cable, and express facilities to the citizens of any belligerent countries which should interfere with American mails or withdraw commercial privileges. A fourth clause prohibited the importation through any foreign country, except when bound for an American port, of any fish taken in the North Pacific or its tributaries. The bill passed the Senate on Sept. 6, after a continuous session of 14 hours. The vote was 42 to 16. The Democrats, supporting it solidly, were joined by five Republicans—Clapp (Minn.), Cummins and Kenyon (Iowa), La Follette (Wis.), and Norris (Neb.).

In the main the conferees accepted the Senate's changes. But they eliminated the third and fourth retaliatory measures just described; fixed the munition manufacturer's tax at 12½ per cent. of net profits, the same rate applying to materials used in producing munitions; and allowed the $4,000 income-tax exemption to apply not only to married persons but to heads of families as well. President Wilson signed the bill on Sept. 8. The detailed provisions of the bill are described elsewhere (see XIV, *Public Finance*).

The Shipping Act.—The failure of the ship-purchase measure in 1915, when Senator Clarke (Ark.) and six other Democrats deserted the Administration (*A. Y. B.*, 1915, p. 71), indicated that concessions would have to be made to secure its passage through the Sixty-fourth Congress. President Wilson, in his message, foreshadowed changes "in some essential particulars"; and it was hoped that such changes would placate Senator Clarke and Mr. Kitchin. The revised bill, worked out by the Secretary of the Treasury and the Secretary of Commerce, was introduced in the House on Jan. 31. It erected a Shipping Board of five members, the Secretaries of the Navy and Commerce *ex officio* and three others appointed by the President and Senate for six years and paid $10,000 a year; it invested this Board with authority to regulate commerce on the high seas and the Great Lakes, an authority extending not only to the fixing of reasonable rates, but to the licensing of all vessels, irrespective of nationality, engaged in interstate and foreign commerce, to the approval of the sale of American vessels to foreign interests, to the control of competitive practices, and to the sanctioning of pools which would otherwise be illegal under the Sherman Act; and it empowered the Board to spend a maximum sum of $50,000,000 in acquiring ships which should be leased or sold to private capitalists for the establishment of new services, or which, failing such arrangements, should be operated under a corporation controlled by the Government as majority stockholder. Thus Government operation was to be a last resort, not to be undertaken unless the Board found it impossible to interest private capital.

Committee hearings, which began on Feb. 10, elicited a good deal of criticism. Still described as an Administration measure, the bill was revised and reintroduced on April 10 and again revised and reintroduced on May 8. The most important change provided that the corporation formed by the Board should be dissolved five years after the close of the European War, its property then reverting to the Board; that the ships then should be sold, leased, or chartered to American citizens and the other property disposed of to the best advantage; and that the privately owned stock should be taken over by the Board at a fair and reasonable price. Another change confined the general rate-making powers of the Board to interstate commerce except where common carriers in foreign commerce charged rates which appeared to discriminate unjustly between shippers or ports or between exporters of the United States and their foreign competitors. The requirement of a license for common carriers was omitted. In order to minimize political influence, the composition of the Board was altered so as to include five appointed members in addition to the Cabinet officers.

The effect of these changes was to elicit from Mr. Kitchin a promise of active support and from Mr. Clarke an intimation that he might withdraw his opposition. But the Republicans maintained an attitude of resolute hostility, asserting (to quote the minority report from the committee) that the bill "would work immediate and lasting injury." While acquiescing in the creation of the Shipping Board, they deprecated the wide powers entrusted to it. Debate began on May 17 under a special rule which called for final action two days later. But the Republicans, resorting to obstructive tactics and attacking insistently the clauses which empowered the Board to acquire ships and form a corporation to operate them, delayed the passage of the bill until the 20th. The final vote of 211 to 161 followed party lines, only nine Republicans supporting the bill and only two Democrats opposing it. The bill remained substantially unaltered.

In the Senate progress was exceedingly slow. It was not until July 8 that the Democratic caucus finished consideration of the bill and pledged the party to stand behind it. To disarm criticism the caucus made changes which prohibited the purchase of ships flying a belligerent flag, or already engaged in American trade, or 25 per cent. below their original efficiency; and to ensure the nonpartisan character of the Board the two Cabinet officers were eliminated.

In August the Senate reduced the salaries of the Board to $7,500. Senator Borah (Idaho) tried unsuccessfully to secure the adoption of the pending Immigration bill (see *infra*) as a rider, the motion being defeated by 37 to 22. On Aug. 18 the amended bill passed the Senate by a vote of 38 (all Democrats) to 21 (all Republicans). On Aug. 30 the House concurred in the Senate amendments. The President signed the bill on Sept. 7. Details of the provisions of the Act will be found elsewhere (see XX, *The Merchant Marine*).

The Philippines Act.—Another striking success of the Administration was the enactment of the Jones bill extending a large measure of autonomy to the Filipinos and a promise of ultimate independence. This bill, in varying forms, had been before Congress ever since the Democrats assumed control of the House in 1911; President Wilson had urged its adoption in each of his annual messages; it had passed the House in 1914 and come before the Senate, favorably reported, in 1915 (*A. Y. B.*, 1915, p. 250). In January, 1916, to the surprise of Congress and the country, Senator Clarke (Ark.) offered an amendment to the pending bill, which fixed a definite time for the evacuation and abandonment of the islands. The amendment granted complete independence in not less than two or more than four years at the discretion of the President, with the proviso that, in case of disturbed internal conditions, the period might be extended to embrace the next session of Congress and thus permit of modifications in the Act. It also provided for the neutralization of the islands by international agreement, failing which the United States should guarantee their independence for five years and reserve such control as would make the guarantee effective. These proposals the President tacitly approved. But before the Senate voted upon them two important modifications were introduced: one, on motion of Mr. Clarke, striking out the guarantee provision; the other, on motion of Mr. Kenyon (Iowa), striking out the neutralization provision. Mr. Kenyon's motion, which carried by a vote of 53 to 31, was supported by 30 Republicans, most of whom believed that it would fatally weaken the Clarke amendment and ensure its defeat. Their expectations were all but realized, for it required the casting vote of Vice-President Marshall to break the tie of 41 to 41. Two days later, on Feb. 4, the amended bill passed the Senate by 52 to 24, five Republicans (Borah, Kenyon, La Follette, Norris, and Works) joining the Democratic majority. Just before final passage the Senate rejected (60 to 17) an amendment by Mr. Stone (Mo.) to restore the neutralization provision.

The adoption of the Clarke amendment evoked widespread criticism. Lindley M. Garrison, the Secretary of War, informed the President that he considered the principle which it involved "an abandonment of the duty of this nation and a breach of trust toward the Filipinos; so believing, I cannot accept it or acquiesce in its acceptance." The President replied that he must withhold judgment until the joint action of the two houses reached him and that it would be "most indefensible" to announce his dissent before that time. Soon afterwards, in his anxiety to avoid the risks of a disagreement, he urged Democratic leaders in the House to accept the Senate amendments. On March 1 the Committee on Insular Affairs reported the Senate bill without alteration. But when the Democratic caucus met on April 26, symptoms of disquiet manifested themselves. While the House Democrats had hitherto been more favorable to Philippine independence than the Senate Democrats, public condemnation of the Clarke amendment had tended to modify their attitude. After the caucus had endorsed the Senate bill by a vote of 140 to 35, 28 members (more than half of them from New York) announced that they would not be bound by the resolution. In view of the small Democratic majority their defection proved decisive. On May 1, with the assistance of 30 Democrats, the Clarke amendment was struck out by a vote of 213 to 165, after one of the bitterest conflicts of the session. The House, discarding the Senate bill, now substituted its own measure which provided

for independence at some indefinite time, "as soon as a stable government can be established."

The conference report was adopted by the Senate on Aug. 16, the vote being 37 (all Democrats) to 22 (including one Democrat); and by the House two days later, the vote being 34 to 29. President Wilson, signing the bill on Aug. 29, described it as "a very satisfactory advance in our policy of extending to them self-government and control of their own affairs. It is only by such means that any people comes into contentment and into political capacity, and it was high time that we did this act of justice." (See also VIII, *The Philippines.*)

The Child Labor Act.—The passage of the Child Labor Act, marking as it did a new conception of the interstate commerce powers of Congress, must rank among the most significant achievements of the session. A similar measure, introduced by Senator Beveridge some ten years ago, had met with open ridicule; President Wilson had described it as "obviously absurd." Nothing could better illustrate the rapid growth of centralizing tendencies than the attitude now assumed both by the President and by Congress. As it passed the House on Feb. 2 the bill excluded from interstate commerce the products of mines, quarries, and manufacturing establishments into which proscribed child labor had entered; the minimum age for factories was fixed at 14 years and for mines and quarries at 16 years, while no child under 16 could be employed for more than eight hours a day. The final vote upon the bill was 357 to 46. The Committee on Interstate Commerce presented to the Senate a substitute measure. While retaining the same standards of age and hours, it excluded from foreign as well as interstate commerce not simply articles into which child labor had entered, but all articles produced in establishments employing child labor, a change which would greatly simplify the enforcement of the Act.

Opposition in the Senate was more formidable than in the House. A group of Southern Senators, said to be acting in the defense of cotton-mill interests, resolved to prevent the passage of the bill by resorting, if necessary, to a filibuster. In view of their determined stand the Democratic caucus dropped the bill from its programme of imperative legislation and decided to hold it over till the next session. But at this juncture the influence of the Administration was brought to bear; and the caucus, yielding to Executive pressure, reconsidered its action on July 25.

The debate, which began on Aug. 5, dealt mainly with constitutional questions. Mr. Robinson (Ark.) contended that under court decisions the power of Congress to regulate interstate commerce was complete and absolute except as limited by the Constitution itself; that the only limitation was to be found in the Fifth Amendment, which imposed upon the Federal Government the same limitation which the Fourteenth imposed on the states; and that if the states could suppress child labor under their police power, Congress could do likewise under its commerce power. This argument was sustained by Mr. Borah (Rep., Idaho). The most persistent opposition came from Mr. Hardwick (Ga.) and Mr. Overman (N. C.), the latter going so far as to justify child labor as a means of keeping children out of mischief. Mr. Works (Cal.), supporting the bill on humanitarian grounds, nevertheless considered it unconstitutional. If the Supreme Court upheld it, he said, there would be no dividing line between the sovereignty of the states and the sovereignty of the nation.

The bill passed the Senate on Aug. 8 by a vote of 52 to 12. The minority included two Republicans, Oliver and Penrose of Pennsylvania, and ten Democrats—Bankhead (Ala.), Bryan and Fletcher (Fla.), Hardwick and Smith (Ga.), Overman and Simmons (N. C.), Tillman and Smith (S. C.), and Williams (Miss.). After some delay the House accepted the Senate bill as recommended by the conferees. The President signed it on Sept. 1. (See also XV, *Child Labor;* and XVI, *Labor Legislation.*)

The River and Harbor Appropriation Act.—Notwithstanding the certainty of an enormous deficit in the national finances, Congress appropri-

ated almost $43,000,000 for river and harbor improvements (see also X, *Waterways and Harbors*). Many provisions of the Act were quite indefensible. Predicting that it would be the last measure of its kind to pass Congress, Senator Kenyon (Ia.) said:

> You are voting at least $20,000,000 into this bill that is absolutely unjustifiable. You are dumping thousands of dollars into streams where commerce is rapidly disappearing and into streams with less than a foot of water in them and into streams that you could not recognize as such when you crossed them. . . . The people are awakening to the fact that votes are cast in Congress very largely that reciprocity may follow fawning.

The House bill, passed on April 11 by a vote of 210 to 133, carried $39,600,000. Repeated efforts were made to modify or eliminate particular items. Mr. Mann (Ill.), the Republican leader, proposed to reduce the aggregate sum to $20,000,000, but the original provisions were retained in every case. The Senate Committee on Commerce, while it added more than $3,000,000 to the bill, struck out an item of $500,000 for the deepening of the East River and the approaches to the Brooklyn Navy Yard, although the President and the Secretary of the Navy had urged the necessity of this improvement. Mr. Kenyon, in a minority report signed by himself and Mr. Sherman (Ill.), declared that the money was being poured into "waterless streams and dry rivers." He advocated not only the adoption of a substitute bill authorizing the Secretary of War to spend not more than $20,000,000 on the continuance of necessary works, but also the establishment of a river and harbor commission which would take the problems of water transportation and flood control out of politics. The sharp and specific criticisms of Mr. Kenyon, his unsparing attack upon items which the Army engineers had condemned, were not without effect. Several Democrats were equally outspoken. Although the bill authorized the expenditure of $300,000 in his state, Mr. Tillman (S. C.) denounced it as deliberate stealing from the Treasury and expressed the hope that the President would veto it. Mr. Husting (Wis.) moved that the bill be recommitted with instructions to reduce the amount appropriated to $20,000,000; Mr. Taggart (Ind.) moved that no part of the appropriations should be spent without the approval of the Secretary of War. Both amendments failed. After three weeks of debate the bill passed the Senate by a vote of 35 to 32, with seven Republicans supporting and nine Democrats opposing it, and the President signed it on July 27.

The Armed Merchantmen Controversy.—Throughout the early months of the session controversies arising out of the European War attracted much attention and at times provoked spirited debates. Discussion ranged about two main issues, the injury to American interests through the British blockade and the propriety of warning Americans not to travel on the armed merchantmen of belligerent countries. Trade restrictions incident to the blockade affected the cotton area of the South, and Senator Smith (Ga.), bitterly condemning British practices, urged retaliation in the form of an embargo on the shipment of arms and munitions to the Entente Allies. More than a dozen Senators of both parties, including O'Gorman (N. Y.) and Hitchcock (Neb.), actively supported this proposal; Mr. Kenyon (Ia.) presented a monster petition in its favor. But those who sympathized with the cause of the Allies deprecated any such action while the more serious injuries inflicted by Germany went unpunished, Mr. Lodge (Mass.) declaring that an embargo would fall little short of an act of war and would be worth another million men to Germany. The most notable defense of the President's policy in this matter came from Mr. Williams (Miss.), who excoriated the Republicans for trying to force the President into war with Mexico, where the outrages had been committed by bandits, and for trying to maintain friendship with Germany in spite of the fact that German outrages were sanctioned by a fixed and determined policy of the Government. An equally sharp cleavage of opinion was manifested in the House. The only action which Congress took was to incorporate certain retaliatory measures in

the General Revenue Act (see *supra;* and III, *International Relations*).

The controversy with respect to armed merchantmen reached an acute stage in the month of February and threatened to involve the President in a conflict with his party. On Jan. 18 the United States had informed the Entente Allies that, in its opinion, "any armament on a merchant vessel would seem to have the character of an offensive armament"; and the Central Powers, taking shrewd advantage of the situation, had announced that after March 1 they would treat armed enemy merchantmen as ships of war. Congress showed an unmistakable tendency to accept the view thus formulated by the Administration and practically applied by the Central Powers. The desire to avoid a rupture with Germany found expression in the proposal that American citizens should be warned against traveling on armed liners. But on Feb. 15 the Administration shifted its position. In a statement given to the press it declared that merchantmen had a legal right to carry armament for the sole purpose of defense and that the right of American citizens to travel on such vessels should not be impaired (see also III, *International Relations*). This declaration ran counter to the prevailing sentiment in Congress, and in view of the announced policy of the Central Powers it seemed to bring the country measurably near to war. Although the President conferred with Democratic leaders on the 21st and insisted that he should have a free hand in dealing with the situation, Congress showed no inclination to give way. Senator Gore (Okla.) introduced a resolution to the effect that American citizens should "forbear to exercise the right to travel as passengers upon any armed vessel of any belligerent power," and that no passport should be issued to any American citizen for the purpose of such travel. In the House Mr. McLemore (Tex.) introduced a resolution which requested the President to warn American citizens that they should refrain from travelling on armed belligerent ships and that any such travel in neglect of this warning would be at their own risk.

A serious conflict between the President and Congress seemed inevitable. Senator Stone, chairman of the Foreign Relations Committee, informed the President in a letter of Feb. 24 that the situation was such as to "excite a sense of deep concern in the minds of careful and thoughtful men. . . . As much and deeply as I would hate to radically disagree with you, I find it difficult from my sense of duty and responsibility to consent to plunge this nation into the vortex of this world war." President Wilson replied immediately. He would do everything in his power to keep the country out of war; and since the Central Powers had faithfully kept their promises in the past, he felt confident that existing difficulties would be adjusted satisfactorily. But otherwise,

> we should, it seems to me, have in honor no choice as to what our course should be. For my own part, I cannot consent to any abridgment of the rights of our citizens in this respect. The honor and self-respect of the nation are involved. We court peace and shall preserve it at any cost but the loss of honor. . . . If in this instance we allowed expediency to take the place of principle, the door would inevitably be opened to still further concessions. Once accept a single abatement of right and many other humiliations would certainly follow.

Next day the President held a further conference with the Democratic leaders of the House. "We told the President," Speaker Clark said afterwards, "that the warning resolution would carry two to one, if we ever got a chance to vote."

Up to this time the President had taken a determined stand against any action by Congress. But on Feb. 29, with dramatic suddenness, he requested Mr. Pou, acting chairman of the House Rules Committee, to secure an early vote on the McLemore resolution and to afford "an immediate opportunity for full public discussion and action upon it." Leaders of both houses, after conferring with the President, agreed to bring the pending resolutions to a vote. The Senate acted on March 3. It did not vote on the original Gore resolution. The new strength developed by the Administration forces would have ensured its defeat. Senator Gore, in order to embarrass his adversaries, sub-

stituted a new resolution. It provided that the sinking by a submarine of an armed enemy merchantman without notice or warning would, if it resulted in the death of an American citizen, constitute a just and sufficient cause of war between the United States and the German Empire. The original preamble, though inconsistent with the new resolution, was retained. The Senate did not express itself directly on the issue. It tabled the resolution by a vote of 68 to 14; 47 Democrats (including Gore) voted in the affirmative, two (O'Gorman and Chamberlain) in the negative. The greatest confusion prevailed; there had been no opportunity to discuss the amended resolution; and a dozen Senators afterwards considered it necessary to explain their attitude. The President's policy had been neither condemned nor vindicated; but it had been left in his hands without interference from the Senate. On the real issue party lines did not hold. After the vote had been taken Mr. Clarke (Ark.) declared that the Administration had never been neutral, that its every act had shown favor to the Entente Allies; on the other hand Mr. Borah (Rep., Idaho) gave his full support to the President throughout the debate.

In the House delay was occasioned by the temporary absence of many Democrats and by the insistence of Mr. Kitchin, the floor leader, that a direct vote should be taken on the McLemore resolution. The Rules Committee was opposed to a direct vote, and it brought forward a special rule which excluded amendments, limited debate, and submitted a motion for the tabling of the resolution. On March 7 three votes were taken. The House first of all adopted the previous question shutting off debate on the rule, the vote being 256 to 160; then the rule itself, by a vote of 272 to 137; and finally the tabling motion, by a vote of 276 to 142. The majority included 182 Democrats, 93 Republicans, one Progressive; the minority, 33 Democrats, 102 Republicans, five Progressives, and one Socialist. The President drew his main strength from the Atlantic seaboard. For him it was a substantial victory, because the House, notwithstanding its overwhelming sympathy with the purpose of the McLemore resolution, had subordinated its own views to those of the President and recognized his right to deal with diplomatic issues. (See also *The Presidential Campaign, infra;* and III, *International Relations.*)

The Immigration Bill.—The Immigration bill which had been vetoed by President Wilson in 1915 (*A. Y. B.*, 1915, p. 400) was reintroduced by Mr. Burnett and favorably reported to the House on Jan. 31. The bill provided for the exclusion of "all aliens over 16 years of age physically capable of reading, who cannot read the English language or some other language or dialect"; the exclusion of Hindus and of persons incapable of becoming naturalized, unless otherwise provided for in treaties, conventions or agreements; an increase from $4 to $8 in the head tax; and a more severe penalizing of steamship companies for transporting undesirable immigrants. Sentiment in favor of the bill was strengthened by the fear of enormous immigration after the war. On March 27 the House sustained the literacy test by a vote of 225 to 82; and two days later it passed the bill by a vote of 308 to 87.

The clause excluding Hindus and persons incapable of naturalization was directed against Orientals generally. It excepted cases regulated by agreements such as the Root-Takahira agreement which prevented Japanese coolies from entering the continental United States. But the Japanese Government, having adhered honorably to the agreement, regarded the language of the bill as offensive and made representations to the State Department. Influenced by this protest, the Senate Immigration Committee amended the clause on May 16; it proscribed Asiatic immigration from an area bounded by lines of latitude and longitude not embracing Japan. On July 31 the Democratic caucus decided not to consider the bill until the next session; and although on Aug. 21 ten Democrats voted with the Republicans in favor of consideration, next day, when the President indicated that he would veto the bill, five of them reconsidered their action

and supported the Democratic party leaders in making an indefinite postponement. The vote was 32 to 23.

(See also *The Sixty-fourth Congress, Second Session, infra;* and XV, *Immigration.*)

THE SIXTY-FOURTH CONGRESS, SECOND SESSION

The President's Message.—The second session of the Sixty-fourth Congress opened on Dec. 4, and on the following day President Wilson delivered his message before a joint session of both houses. He made no allusion to foreign relations. The main theme of the message was the necessity of completing the legislation which he had proposed on Aug. 29 when the country was confronted with the prospect of a disastrous strike of railroad trainmen (see *The Administration, infra*). He recommended therefore (1) that the Interstate Commerce Commission be reorganized, with an increase of its membership from seven to nine; (2) that strikes and lockouts should be declared illegal pending a full public investigation of the matters in dispute; and (3) that the Executive should be empowered, in case of military necessity, to control and operate railroads and to draft railroad officials and employees into the military service of the Government. One of the original proposals, that Congress should authorize the Interstate Commerce Commission to consider the advisability of raising freight rates in order to recoup the railroads for the losses entailed by the eight-hour day, the President now abandoned. He did so on the ground that "the power of the Interstate Commerce Commission to grant an increase on the ground referred to is indisputably clear, and a recommendation by the Congress in regard to such a matter might seem to draw in question the scope of the Commission's authority." The President also advocated final action upon three bills which had passed the House in the preceding session: the Porto Rico Citizenship bill (see VIII, *Porto Rico*), the Corrupt Practices bill, and the Webb bill permitting American exporters to combine for the promotion of foreign trade. He also recommended the enactment of the vocational education measure (see XV, *Vocational Education*).

The Immigration Bill.—On Dec. 11 the Senate took up the Immigration bill which had been held over from the previous session (see *supra*). No important amendments were carried. For several days Senators from the Pacific coast attacked the clause which, while excluding Orientals generally, made an exception in favor of the Japanese; but the only amendment which they were able to secure was one providing that the present Act should in no way affect the force of any existing treaty or agreement which prohibited or restricted immigration. The amended clause was passed by 42 to 14, Western Senators opposing it. Another amendment would exclude all persons coming to the country for temporary employment as laborers and intending afterwards to return to their native land. A clause which excluded those who teach or advocate the destruction of property was modified so as not to include such destruction as might occur in the course of war, revolution or political insurrection. The bill passed the Senate on Dec. 14 by the overwhelming vote of 64 to 7. Those voting in the minority were: Brandegee (Conn.), Colt (R. I.), Husting (Wis.), Martine (N. J.), du Pont (Del.), Phelan (Cal.), Reed (Mo.).

National Defense.—In the middle of December the Committee on Military Affairs of the Senate began hearings on a bill providing for universal military service. Generals Scott and Wood condemned the federalized National Guard and maintained that the only democratic, economical, and effective way of meeting the requirements of national defense was through universal service.

THE ADMINISTRATION

The Foreign Policy of the Administration.—During the course of the year President Wilson delivered many addresses which touched the vital concerns of the nation in foreign policy. He continually held before the

people a high ideal of their mission in international society, emphasizing the absence of selfish motives and the desire to serve mankind. "America will have forgotten her traditions," he said on April 17, "whenever upon any occasion she fights merely for herself under such circumstances as will show that she has forgotten to fight for all mankind. And the only excuse that America can ever have for the assertion of her physical force is that she asserts it in behalf of the interests of humanity." "I believe," he said on June 29,

that, at whatever cost, America should be just to other peoples and treat other peoples as she demands that they should treat her. She has a right to demand that they treat her with justice and respect . . . , but she cannot with dignity and self-respect insist upon that unless she is ready to act in the same fashion toward them.

America ought to keep out of the war, he said on Feb. 6, "at the sacrifice of everything except the single thing upon which her character and history are grounded—her sense of humanity and justice. If she sacrifices that, she has ceased to be America." He also wished to make it clear that the Mexican expedition had been prompted by no spirit of aggrandizement. "Do you think," he asked on June 30,

that the glory of America would be enhanced by a war of conquest in Mexico? Do you think that any act of violence by a powerful nation like this against a weak and distracted neighbor would reflect distinction upon the annals of the United States? Do you think it is our duty to carry self-defence to the point of dictation in the affairs of another people?

And again on July 10:

What makes Mexico suspicious of us is that she does not believe as yet that we want to serve her. She believes we want to possess her. And she has justification for that belief in the way in which some of our fellow-citizens have tried to exploit her privileges and her possessions. For my part I will not serve the ambitions of those gentlemen, but I am willing to serve all America by trying to serve Mexico herself.

Speaking before the Pan-American Scientific Congress on Jan. 6, the President indicated his desire to promote the most cordial relationships between the American republics (see also III, *International Relations;* and IV, *Latin America*).

The President gave equal attention to the new commercial position which the United States had assumed in the world and to the consequent interest which she must display in the maintenance of world peace. "We must play a great part in the world, whether we choose it or not," he said on July 10. "We have got to finance the world in some important degree, and those who finance the world must understand it and rule it with their spirits and their minds." In a speech of May 27 he declared that "the United States is willing to become a partner in any feasible association of nations" formed in order to realize certain fundamental objects and make them secure against violation. These objects were: first, that every people shall have the right to choose the sovereignty under which they shall live; second, that the small states of the world shall enjoy the same rights as the large states; and third, that the world has a right to be free from every disturbance of its peace having origin in aggression and the disregard of popular rights. "If it ever should be our privilege to suggest or initiate a movement for peace among the nations now at war, I am sure that the people of the United States would wish their Government to move along these lines": first, such a settlement of the war as the belligerents may agree upon, the interest of the United States being only in peace and future guarantees; and second,

a universal association of nations to maintain the inviolate security of the highway of the seas for the common and unhindered use of the nations of the world, and to prevent any war begun either contrary to treaty covenants or without warning and full submission of the causes to the opinion of the world—a virtual guarantee of territorial integrity and political independence.

On May 30, replying to critics who had reminded him of Washington's objection to entangling alliances, he said:

I shall never myself consent to an entangling alliance, but I would gladly assent to a disentangling alliance, an alliance which would disentangle the people of the world from those combinations in which they seek their own separate and private interests, and unite with the people of the world to preserve the peace of the world upon a basis of common right and justice.

On Oct. 5 he interpreted Washington's words as meaning that the United States should avoid quarrels of ambition and avarice, not that it should "avoid the entanglements of the world, for we are part of the world, and nothing that concerns the whole world can be indifferent to us." And on Oct. 12 he reiterated his declaration that "when the great present war is over it will be the duty of America to join with the other nations of the world in some kind of a league for the maintenance of peace." He declared, on Oct. 26, that

> this is the last war of the kind or of any kind that involves the world that the United States can keep out of. I say this because I believe that the business of neutrality is over; not because I want it to be over, but I mean this, that war now has such a scale that the position of neutrals sooner or later becomes intolerable.

In view of these numerous allusions to the interest of America in world affairs no surprise was created by the suggestion contained in the note of Dec. 18 to the belligerent powers (see III, *International Relations*):

> In the measures to be taken to secure the future peace of the world, the people and Government of the United States are as vitally and as directly interested as the Governments now at war. . . . They stand ready, and even eager, to coöperate in the accomplishment of these ends, when the war is over, with every influence and resource at their command.

The altruistic spirit manifested in the President's speeches found practical expression in the Philippines Act which granted a very large measure of self-government and promised ultimate independence. But at the very time when withdrawal from the Philippines was under consideration, the Senate ratified treaties which marked a significant expansion of American influence in the West Indies and Central America. The treaty with Nicaragua, ratified on Feb. 18, not only removed all danger of a foreign power undertaking to construct an interoceanic canal, but it also furnished the United States with naval bases on the Pacific and the Caribbean. The treaty with Haiti, ratified on Feb. 28, established a protectorate under which the United States, assuming control of finances and police, agreed to "lend an efficient aid for the preservation of Haitian independence and the maintenance of a government adequate for the protection of life, property, and individual liberty." Soon after the occupation of the Dominican Republic began. It proceeded through the summer, not without bloodshed. The proclamation of Nov. 29, setting up military rule, foreshadowed the establishment of a protectorate patterned after the Haitian prototype. The course followed by the Administration was substantially one of military conquest followed by American dominion. While ample justification could be found for intervention in both cases, the action nevertheless ran directly counter to the principles which the Administration had professed in regard to Mexico; the President had expressly stated on March 25 that the Mexican expedition had been despatched "for the single purpose of taking the bandit Villa." The acquisition of the Danish West Indies was rendered practically certain in December by the favorable result of a referendum vote in Denmark. Observing the various steps by which a pacific Administration had promoted an imperialistic policy, one could hardly view them as anything but inevitable processes in the evolution which had begun with the Spanish War and received additional impetus from the building of the Panama Canal. (See also III, *International Relations.*)

The Resignation of Secretary Garrison.—The changed attitude of the President with respect to national defense had been manifested in his message of Dec. 8. Speaking in New York on Jan. 27, he frankly admitted his conversion. More than a year had passed since he had, in another message to Congress, decried the agitation for increased armaments. "I would be ashamed if I had not learned something in 14 months. The minute I stop changing my mind as President with the change of all the circumstances of the world, I will be a back number." The New York address, while pacific in tone, suggested the possibility that the United States might be drawn into the war. The American people, said the President, love the principles upon which their political life is founded better than they love peace.

They are ready at any time to fight for the vindication of their character and their honor. They will at no time seek a contest, but they will at no time cravenly avoid it. Because if there is one thing the country ought to fight for and that every nation ought to fight for, it is the integrity of its own convictions.

Next day he began a tour of the Middle West where, in numerous addresses, he sought to explain the necessity of his military programme and to enlist a popular support which would bring pressure to bear upon Congress. His language grew more and more emphatic. In Cleveland he declared that the country must prepare "as effectively and as promptly as possible" because he could not tell what another day would bring forth. In St. Louis he said: "Speaking with all solemnity, I assure you there is not a day to be lost. . . . This month should not go by without something decisive being done." Such language contrasted strongly with the "too proud to fight speech" delivered in May, 1915, and found no precedent in the President's previous utterances.

Specific passages indicated that he still stood sponsor for Secretary Garrison's proposal of a volunteer force of over 400,000 men absolutely under national control. But upon returning from the West, influenced either by his observations there or by political exigencies in Congress, he apparently began to modify his views. In the middle of January, it is true, he had already questioned the necessity of a rigid adherence to the original plan. The Secretary of War had written him a letter on Jan. 12 condemning the project of Mr. Hay, Chairman of the House Committee on Military Affairs, to federalize the National Guard. "The issue must be plainly and clearly drawn," said Mr. Garrison.

It has nothing whatever to do with the number of men to be raised or with the means of raising them. . . . It is between two absolutely different systems, one of which is based upon the nation's undertaking upon its own responsibility the raising and management of the national troops, and the other of which leaves us in the position that we have always been in since the institution of the Government—to rely upon the states doing this thing for the nation—a situation in which the nation is relying upon a military force that it does not raise, that it does not officer and that it does not control.

The President thereupon informed Mr. Garrison that he was ready to accept the Hay plan if it would achieve the same purpose as the volunteer plan. Mr. Garrison restated his position with more emphasis on Jan. 14:

Since the policy that was recommended to you and adopted by you, discarded as absolutely impossible a military system based upon state troops and asserted that the only possible basis for a military policy was national forces, it is entirely clear that the proposals are diametrically opposed to each other and are irreconcilable.

The President replied on Jan. 17:

I am sure that I already understood just what your views were, but I am glad to have them restated in this succinct and striking way. You believe, as I do, that the chief thing necessary is that we should have a trained citizen reserve and that the training, organization and control of that reserve should be under immediate Federal direction. But apparently I have not succeeded in making my own position equally clear to you, though I feel sure that I have made it perfectly clear to Mr. Hay. It is that I am not irrevocably or dogmatically committed to any one plan of providing the nation with such a reserve, and am certainly willing to discuss alternative proposals. . . . If, as the outcome of a free interchange of views, my own judgment and that of the Committee should prove to be irreconcilably different, and a bill should be presented to me which I could not accept as accomplishing the essential things sought, it would manifestly be my duty to veto it and to go to the country on the merits.

On Feb. 9, five days after the President's return from the West, Mr. Garrison reopened the subject. Reliance upon the militia for national defense he condemned as "an unjustifiable imperilling of the nation's safety. It would not only be a sham in itself, but its enactment into law would prevent, if not destroy, the opportunity to procure measures of real, genuine national defense. I could not accept it or acquiesce in its acceptance." He also condemned the Clarke amendment to the Philippine bill (see *supra*). He asked the President to express his final views on these subjects, because, in the event of a disagreement, "I could not with propriety remain your seeming representative in respect thereto." The President replied that, while "not yet convinced" that the Hay plan would prove acceptable, he felt in duty bound to keep his mind open to conviction. As to the Clarke amendment

he considered it unwise at this time, but "it would clearly be most inadvisable for me to take the position that I must dissent from that action should both houses concur in a bill embodying that amendment. That is a matter on which I must, of course, withhold my judgment until the joint action of the two houses reaches me in definite form." Immediately upon the receipt of this letter, Mr. Garrison tendered his resignation, which the President accepted the same day, Feb. 10. Henry Breckinridge, the Assistant Secretary of War, sharing fully the views of his chief, resigned at the same time. A month later Newton D. Baker, former mayor of Cleveland, became Secretary of War (see also V, *The National Administration*).

The President's attitude in this correspondence provoked criticism even among his own adherents. To assert that he must withhold judgment on the Philippines bill until it reached him in final form was altogether inconsistent with his actual conduct during the session. Repeatedly he brought pressure to bear on the Democratic leaders, forcing the reluctant acceptance of some measures and the equally reluctant rejection of others. With respect to the Clarke amendment itself, after its adoption by the Senate he urged the House leaders to accept it. But apparently he made no effort of any kind to save the volunteer plan as embodied in the Senate bill. In both cases political considerations must have dictated his course; and in both public opinion eventually vindicated Mr. Garrison.

President Wilson and the Threatened Railroad Strike.—In February 400,000 railroad trainmen demanded for the freight service an eight-hour day, without reduction of the existing wage for a ten-hour day, and time-and-a-half pay for overtime. Conferences between the managers and the four brotherhoods concerned (Locomotive Engineers, Locomotive Firemen, Railway Conductors, and Railway Trainmen) began in New York on June 1. Two weeks later they terminated without any settlement being reached. The representatives of the trainmen, having resolutely refused to modify their demands or to accept arbitration, now applied for authority to order a strike; and the poll of the brotherhoods, as announced on Aug. 8, showed a majority of more than 90 per cent. in favor of conferring this authority. At the same time the American Federation of Labor pledged "its support and sympathy in the effort to accomplish that which is fundamental for the protection and betterment of the railroad men." Meanwhile the railroads had placed their case before the public in advertisements which appeared in many daily and weekly newspapers throughout the country. They felt that they had "no right to grant a wage preferment of $100,000,000 a year to these employees, now highly paid and constituting only a fifth of all employees, without a clear mandate from a public tribunal that shall determine the merits of the case after a review of all the facts." They suggested the Interstate Commerce Commission as a suitable public tribunal, but were equally ready to proceed under the Newlands Act or to allow the President to appoint arbitrators. On Aug. 9 the managers invoked the services of the United States Board of Mediation and Conciliation, securing from the labor leaders a reluctant acquiescence in the step and a promise to postpone the calling of the strike. Mediation failed, and when the Board finally suggested arbitration, the trainmen would have none of it, especially if any of their established privileges were to be drawn in question through the counter-demands of the railroads. The managers pointed out that the demands of the men would increase the hourly rate of pay 25 per cent. and the overtime rate 87½ per cent.; that the aggregate increase would reach $100,000,000 a year, a sum which could not be paid without increasing passenger and freight rates; and that the trainmen, though constituting only 18 per cent. of the railway employees, already received 28 per cent. of the total pay roll.

A disastrous strike, involving the whole system of railroad transportation, now seemed imminent. At this ominous juncture President Wilson intervened. On Aug. 13 he invited the disputants, before reaching any final decision, to confer with him per-

sonally at Washington. His intervention evoked general expressions of relief and approval. The President proposed as a basis of agreement: (1) that the eight-hour day should be conceded; (2) that the overtime demand of the trainmen and certain contingent demands of the railroads should be postponed "until facts shall have taken the place of calculation and forecast with regard to the effects of a change to the eight-hour day"; and (3) that in the meantime Congress should authorize him to appoint a commission to observe and report upon the results. "The eight-hour day," he afterwards explained, "now undoubtedly has the sanction of the judgment of society in its favor and should be adopted as a basis for wages even where the actual work to be done cannot be completed within eight hours." This proposal satisfied the labor leaders ("Except for his reference to the determination of the cost to the railroads we go along with him"), but not the managers. On Aug. 17, therefore, the railroad presidents were summoned to Washington. They also rejected the proposal, maintaining that the demands of the trainmen were not made for the purpose of reducing the hours of labor, but for the real purpose of accomplishing an increase of wages. They formulated counter-proposals: that without establishing the eight-hour day the railroads should keep a record to show the amount which each man would have earned on that basis, and that a commission appointed by the President should determine the effect of an eight-hour day upon both the railroads and their employees, the railroads agreeing to accept the conclusions of this body as to any matter now in controversy that might be submitted to it by either party. These proposals had been put forward on the 28th. But meanwhile the labor leaders, having grown impatient over the protracted negotiations, had issued a strike order to become effective on Sept. 4. When the President urgently requested its withdrawal, he was informed that the committee of brotherhood chairmen, which had dispersed on the 27th, was the only body empowered to withdraw it.

The only recourse which remained was an appeal to Congress. After several consultations with Democratic leaders, the President appeared before the Houses on Aug. 29 and recommended immediate legislative action. After emphasizing the gravity of the situation and outlining the course of negotiations, he said:

> The representatives of the brotherhoods accepted the plan, but the representatives of the railroads declined to accept it in the face of what I cannot but regard as the practical certainty that they will be ultimately obliged to accept the eight-hour day, by the concerted action of organized labor backed by the favorable judgment of society.
>
> The railroad managers based their decision to reject my counsel in this matter upon their conviction that they must at any cost to themselves or to the country stand firm for the principle of arbitration, which the men had rejected. I based my counsel upon the indisputable fact that there was no means of obtaining arbitration. The law supplied none; earnest efforts at mediation had failed to move the men in the least. To stand firm for the principle of arbitration and yet not get arbitration seemed to me futile, and something more than futile, because it involved incalculable distress to the country and consequences in some respects worse than those of war, and that in the midst of peace. . . .
>
> Having failed to bring the parties to this critical controversy to an accommodation, therefore, I turn to you, deeming it clearly our duty as public servants to leave nothing undone that we can do to safeguard the life and interests of the nation.

He recommended:

(1) The immediate enlargement and reorganization of the Interstate Commerce Commission along the lines of a bill recently passed by the House of Representatives.

(2) The establishment of the eight-hour day as the legal basis both of work and wages for railroad employees.

(3) The appointment of a commission to observe the results of the application of the eight-hour day.

(4) Approval by Congress of the consideration by the Interstate Commerce Commission of freight-rate increases to meet such additional expenditures as the eight-hour day might entail.

(5) Amendment of the Federal statutes providing for mediation, conciliation and arbitration so as to provide for a full public investigation before a strike or lockout might lawfully be attempted.

(6) Lodgment in the hands of the Executive of the power, in case of military necessity, to take control of and operate such portions of the railways as might be required for military use and to draft into the military service of the United States such train crews and administrative officials as might be required.

There was not the same necessity for immediate action on all these six points. The imperative business of the moment was to avert the impending strike. The chairman of the House Committee on Interstate Commerce, Mr. Adamson (Ga.), brought forward a bill which, in its final shape, provided for an eight-hour day (after the end of the year) with the existing ten-hour rate of pay; for a commission of three which should observe the effects of the change during a period of six to nine months, making a report to the President and Congress within 30 days thereafter; and for the maintenance of the existing standard day's wage until 30 days after the rendering of the report. This bill passed the House on Sept. 1 by a vote of 239 to 56; 69 Republicans voted in the affirmative, two Democrats in the negative. The Republican leader, Mr. Mann (Ill.), opposed the bill, asserting that its only purpose was "to have Congress write into law and into contract already made, a provision that for the purposes of compensation eight hours shall be a day's labor. There is no intention on the part of either the railroad managers or the railroad employees to shorten the hours of labor." An amendment, offered by Mr. Clark (Fla.) and extending the eight-hour day to all railroad employees, was defeated by 120 to 81. The Senate bill, drafted by Mr. Newlands (Nev.), chairman of the Interstate Commerce Committee, was broader in scope; while resembling the Adamson measure in other respects, it empowered the Interstate Commerce Commission to fix the hours of labor and the wages of interstate railroad employees at the end of the proposed period of investigation and thereafter. But on Sept. 1 it was displaced by the House bill, which passed next day, after an acrimonious debate, by a vote of 43 to 28. Mr. La Follette (Wis.) was the only Republican to support it; Mr. Hardwick (Ga.) and Mr. Clarke (Ark.), the only Democrats to oppose it. The Democrats justified their attitude as necessary to meet a national emergency; the Republicans charged them with making a weak surrender dictated by considerations of political expediency. The importance of prompt action, the fact that the House would not have time to consider any changes in the bill before Sept. 4, the day set for the strike, led the majority to reject every proposed amendment. Mr. Underwood (Ala.) tried to amend the bill so as to empower the Interstate Commerce Commission to fix wages and hours of labor. "The bill as it stands without this amendment," he said, "is an absolute abandonment of the court of arbitration, and Congress has taken unto itself the right to fix the wages of interstate commerce without a hearing from either side." His motion, though supported by Mr. Newlands, was lost by a vote of 57 to 24. President Wilson signed the bill on Sunday, Sept. 3, and again on Sept. 5 because of his fear that the legality of the earlier signature might be attacked. In view of the general desire to reach an early adjournment, Congress postponed action on the other points of the message; and the President again offered his recommendations at the opening of the next session. This he did notwithstanding repeated statements on the part of brotherhood officials and the president of the American Federation of Labor that they were unalterably opposed to any measure which would compel men to stay at work pending an investigation. (See also XVI, *Labor;* and XX, *Railroads.*)

Presidential Nominations in the Senate.—On Jan. 28 President Wilson nominated Louis D. Brandeis of Boston to be Associate Justice of the Supreme Court in the room of Joseph Rucker Lamar, deceased. The nomination created something like amazement in the Senate. Every one recognized the eminent ability of Mr. Brandeis as a lawyer; but his outspoken radicalism, his supposed defects of temperament, and vague rumors of unprofessional conduct led many Senators to question the advisability of his elevation to the bench. The sentiment against confirmation was overwhelming at first. But in a period of four months, while the charges were being carefully scrutinized, a marked change of opinion took place. Apparently his Jewish extraction raised little prejudice. Opposition came mainly from those

who wished to preserve the Supreme Court from radical influences.

In conformity with the usual practice five members of the Judiciary Committee were appointed as a subcommittee to determine the qualifications of the nominee. Hearings began on Feb. 9. In the course of the next month 47 witnesses were examined by attorneys representing the sub-committee and a group of Boston citizens who had urged the Senate to refuse confirmation. Among those who opposed Mr. Brandeis were seven former presidents of the American Bar Association, including William H. Taft, Joseph H. Choate, and Elihu Root. The objections were presented in a brief which summarized the evidence and maintained that Mr. Brandeis had (1) violated well established canons of professional ethics; (2) made false and misleading statements and shown duplicity in the performance of his professional duties; (3) represented interests opposed to the public welfare and been guilty of sharp practice. On April 1, by a partisan vote of three to two, the sub-committee ordered a favorable report on the nomination, the two Republicans being Mr. Cummins (Ia.) and Mr. Works (Cal.), who both belonged to the progressive wing of the party. It was even then considered uncertain what action the Judiciary Committee would take. For weeks the Committee continued its discussions without making any report. The Democratic majority was divided. On May 8 the President addressed a letter to the chairman, Mr. Culberson (Tex.), asking for prompt and favorable action. He characterized the opposition to Mr. Brandeis as prejudiced and incredible. "Many charges have been made against Mr. Brandeis," said the President.

> The report of your sub-committee has already made it plain to you and to the country at large how unfounded those charges were. They threw a great deal more light upon the character and motives of those with whom they originated than upon the qualifications of Mr. Brandeis. I myself looked into them three years ago when I desired to make Mr. Brandeis a member of my Cabinet, and found that they proceeded for the most part from those who hated Mr. Brandeis because he had refused to be serviceable to them in the promotion of their own selfish interests, and from those whom they had prejudiced and misled. The propaganda in this matter has been very extraordinary and very distressing to those who love fairness and value the dignity of the great professions. I perceived from the first that the charges were intrinsically incredible by any one who had really known Mr. Brandeis. . . .
>
> I nominated Mr. Brandeis for the Supreme Court because it was and is my deliberate judgment that, of all the men now at the bar whom it has been my privilege to observe, test, and know, he is exceptionally qualified. I cannot speak too highly of his impartial, impersonal, orderly, and constructive mind, his rare analytical powers, his deep human sympathy, his profound acquaintance with the historical roots of our institutions and insight into their spirit, or of the many evidences he has given of being imbued, to the very heart, with our American ideals of justice and equality of opportunity; of his knowledge of modern economic conditions and of the way they bear upon the masses of the people, or of his genius in getting persons to unite in common and harmonious action and look with frank and kindly eyes into each other's minds, who had before been heated antagonists.
>
> This friend of justice and of men will ornament the high court of which we are all so justly proud. I am glad to have had the opportunity to pay him this tribute of admiration and of confidence; and I beg that your committee will accept this nomination as coming from me, quick with a sense of public obligation and responsibility.

The letter had no immediate perceptible effect. It was not until May 24 that the Committee ordered a favorable report. The vote was 10 to 8 and strictly partisan. Originally four of the Democrats—O'Gorman (N. Y.), Reed (Mo.), Shields (Tenn.), and Smith (Ga.)—had been regarded as definitely opposed to confirmation even after the extended hearings had closed. But one by one they had shifted their position. Party influences had been at work in the Senate. When final action was taken on June 1, the appointment was confirmed by a vote of 47 to 22. Three progressive Republicans voted in the affirmative —Mr. La Follette (Wis.), Mr. Norris (Neb.), and Mr. Poindexter (Wash.); two others were paired in the affirmative—Mr. Clapp (Minn.) and Gronna (N. D.). The only Democrat voting in the negative was Mr. Newlands (Nev.), who, while regarding Mr. Brandeis as a distinguished publicist and propagandist, believed that he lacked the judicial temperament.

On May 15 the Senate rejected the

nomination of George Rublee as a member of the Federal Trade Commission, the vote being 42 to 36. This apparently ended a controversy which began in February, 1915, when Mr. Rublee was nominated as a member of the Commission and the Senate withheld confirmation. It was maintained that his appointment would violate, in spirit at least, the law which specified that not more than three members should belong to the same political party; for Mr. Rublee, though presumed to be a Republican, had actively supported the Democratic opponent of Senator Gallinger of New Hampshire in the elections of 1914. Senator Gallinger objected to confirmation on personal grounds and prevailed over the wishes of the President by invoking the principle of "Senatorial courtesy." On May 23 a motion to reconsider the earlier vote failed, the Senate being equally divided and the Vice-President being paired with a Senator and therefore without a casting vote.

Conspiracies and Violations of Neutrality.—Evidence of the activity of German agents in the United States and of conspiracies to violate neutrality laws steadily accumulated during the early part of the year. On Jan. 21, in response to a resolution adopted by the House of Representatives, the Attorney-General furnished a list of 71 individuals and four corporations indicted in the Federal courts because of alleged complicity in criminal plots. These and later indictments were, for the most part, returned under the broad charge of conspiracy; and in view of the deficiencies of the neutrality laws which necessitated such procedure, the Administration recommended on June 3 that Congress should enact new legislation to cover specific offences against American neutrality. In March and April the sensational disclosures of a German agent, Major von der Goltz, brought to light another conspiracy for the destruction of the Welland Canal. The conspiracy involving Koenig and others (*A. Y. B.*, 1915, p. 68) took place, according to the indictment, in September, 1915; the new charges had to do with a military enterprise set on foot in the early weeks of the war. Von der Goltz, after being actively employed in the United States, went to England where he was imprisoned as a spy. To escape execution he made revelations of such an important nature that he was released by the British Government to give testimony in New York. That testimony, along with certain documents which the British authorities had found among Capt. von Papen's effects when he was returning to Germany after his recall (*A. Y. B.*, 1915, p. 67), resulted on April 17 in the indictment of Capt. Franz von Papen, former military attaché of the German Embassy; Wolf von Igel, who had served as von Papen's secretary; Capt. Hans Tauscher, American agent of the Krupp corporation, and two others. For the first time the German Embassy was implicated in an alleged violation of the neutrality laws. Von Igel, who was arrested in a New York office formerly occupied by von Papen, resisted proceedings against him on the ground that he could claim diplomatic immunity; and Count von Bernstorff, the German Ambassador, not only supported his contention, but demanded that the documents seized at the time of the arrest should be surrendered without being copied or photographed. The Federal authorities maintained, however, that the offences charged in the indictment had been committed a year before von Igel joined the Embassy staff and that the New York office, having been leased in the name of a private individual, could not be regarded as part of the Embassy. After photographing the papers, they offered to return any of them which the Ambassador should identify as official. On June 12 Judge Wolverton in the Federal district court overruled a demurrer asking for the dismissal of the indictment on the ground that the alleged offences did not constitute a military enterprise. Captain Tauscher was brought to trial on June 26. According to von der Goltz he had supplied the military expedition with arms and explosives and with money obtained from von Papen. The jury, however, returned a verdict of not guilty.

Some weeks after the arrest of Charles C. Crowley, a detective em-

ployed by the German consulate at San Francisco (*A. Y. B.*, 1915, p. 66), the Federal grand jury returned indictments against 31 individuals and corporations, including Franz Bopp, the German consul-general; several other German consular officials, and the Turkish consul-general. Bopp and five others were charged with conspiracy to restrain the foreign commerce of the United States in munitions of war and to organize a military expedition to destroy British property in Canada. The remaining 25 were charged with conspiracy to defraud the Government by making San Francisco a supply base for belligerent ships at sea or by supplying such ships with stores to which they were not entitled or by making out false manifests. On March 3 Judge Dooling sustained a demurrer to the indictment which charged Bopp and others with setting on foot a military expedition, the language of the indictment being too general and no evidence appearing that the alleged activities constituted a military expedition. Nevertheless, Bopp, Crowley, and three others were convicted by a jury on Jan. 10, 1917. Carl A. Lüderitz, German consul at Baltimore, was indicted on May 8 for conspiring with Major von der Goltz in the fraudulent procurement of a passport. This passport enabled von der Goltz, under the name of Bridgman Taylor, to return to Germany and afterwards visit England where he was arrested as a spy. Robert Fay, Walter Sholz, and Paul Daeche, who had conspired to destroy vessels engaged in the transportation of arms and munitions to the Entente Allies (*A. Y. B.*, 1915, p. 66), were convicted on May 9. The court sentenced the first two to eight years' imprisonment and Daeche, for whom the jury had recommended leniency, to two years. Some months later Fay escaped from the Federal Prison at Atlanta under circumstances which indicated aid from confederates outside. On April 28 indictments were found in New York against Dr. Walter Scheele, president of a chemical firm in New Jersey, and eight Germans connected with the Hamburg-American and North German Lloyd lines. They were charged with manufacturing bombs and placing them on vessels carrying arms and munitions. Capt. Charles von Kleist confessed that they had manufactured more than 200 bombs and that the necessary funds had come from von Papen, Boy-Ed, and von Rintelen. On May 8 Dr. Scheele, Wolf von Igel, and G. Steinberg were indicted for conspiring to falsify a ship's manifest in order to send a cargo of lubricating oil to Germany. The finding of so many indictments and the implication of so many German agents naturally did much injury to the German cause in the United States. On May 18 Count von Bernstorff announced that "in consequence of cases that have occurred of late the German Ambassador has sent instructions to all German consuls in the United States to strongly impress upon German citizens living in their districts that it is their duty scrupulously to observe the laws of the states in which they reside."

Following the indictment of Representative Frank Buchanan, H. Robert Fowler, and six others for conspiracy to restrain the foreign commerce of the United States in war materials (*A. Y. B.*, 1915, p. 66), efforts were made to enlist the support of organized labor on their behalf. A statement issued on Dec. 30, 1915, warned laboring men of "the great danger which awaits their future struggles for economic liberty and justice should a precedent be established by the courts in upholding a prosecution and conviction under such a construction of this statute (the Sherman Act) as is now proposed by the United States Attorney Marshall." Marshall himself was attacked. On Dec. 14, 1915, while the grand jury's investigation was in progress, Buchanan offered in the House a resolution for his impeachment. The resolution charged Marshall with corruptly refusing to prosecute gross and notorious violations of the law by criminal trusts and monopolies, using the powers of his office to defame the good name of peaceful citizens, and refusing to prosecute men who had made the port of New York a naval base for foreign belligerents. On Feb. 29 a sub-committee of the House Judiciary Committee began in New York

an investigation into the conduct of the district attorney's office. On March 4, in a letter to its chairman, Mr. Carlin, the district attorney assumed responsibility for a newspaper article whose author, refusing to divulge the source of his information, had been held in contempt and placed under arrest. He admitted saying that he regarded "a member of Congress who would take money for an unlawful purpose from any foreign agent as a traitor" and that such a person merited more severe punishment than the Sherman law allowed. He admitted saying that

> your expedition to this town was not an investigation conducted in good faith, but was a deliberate effort to intimidate any district attorney who had the temerity to present charges against any one of your honorable body. . . . I realize that your effort was to ruin me and my office by publishing with your full approval the complaints of various persons who have run afoul of the criminal law under my administration.

Mr. Marshall afterwards informed Mr. Webb, chairman of the Judiciary Committee, that this letter was not intended as an affront to the full committee or the entire membership of the House. But on April 14 a select committee recommended that Marshall be brought before the bar of the House to answer for contempt. His letter was "as a whole and in several separate sentences defamatory and insulting. . . . It is as much a violation of the privileges of the House to have directed a scurrilous and offensive letter of this character against one of its committees as if it had been addressed directly to the House." The House sustained the report of the committee on June 20 by a vote of 208 to 85. Mr. Marshall sued out a writ of habeas corpus to protect himself from arrest by the sergeant-at-arms; and when, on July 19, the writ was dismissed in the Federal district court, he carried an appeal to the U. S. Supreme Court. Meanwhile the Carlin sub-committee had filed a report criticizing the district attorney, but exposing no evidence of corruption and making no recommendation for impeachment. The Judiciary Committee, on Aug. 4, advised the House to proceed no further with Buchanan's charges.

POLITICS AND PARTIES

James Albert Woodburn

The year 1916 was one of notable popular activity and interest in American politics and party life. It witnessed the practical disappearance of the Progressive party, the all but successful effort to reunite the divided Republican party of 1912 in opposition to the administration of President Wilson, and, as a consequence, one of the closest Presidential contests within a generation. It was only the appeal of President Wilson's administration to a large body of independent voters and the failure to induce Progressives in certain western states, notably in California, Kansas, and Washington, to follow the leadership of Mr. Roosevelt and the Progressive National Committee back to the support of the Republican party that made possible the reëlection of President Wilson.

THE PRESIDENTIAL CAMPAIGN

Meeting of the Progressive National Committee.—The year's events in politics opened with a conference of the Progressive National Committee in Chicago on Jan. 11. Every state but one was represented. The conference issued an address to the public restating the principles of the party, essentially the same as set forth in the party platform of 1912 (*A. Y. B.*, 1912, p. 24), and voted to hold the Progressive National Convention in Chicago on June 7, at the same time and in the same city as the Republican Convention. Candidates were not discussed in this conference, but there was a disposition to pave the way for the possible nomination of a joint candidate by both Republican and Progressive parties, other than Theodore Roosevelt, in the hope of being able to present a united opposition to the reëlection of President Wilson. Said the address:

We take this action believing that the surest way to secure for our country the required leadership will be by having, if possible, both the Progressive and Republican parties choose the same standard bearer and the same principles. We are confident that the rank and file of the Republican party and the very large independent vote of the country will support such an effort.

The address put the party on record for "preparedness, military, economic, agricultural, and industrial; attacked the Wilson administration for "failure to deal adequately with national honor and industrial welfare; and declared that the supreme duty in the hour of crisis was to protect American institutions and American standards of justice." It was made clear that union, or fusion, with the Republicans could not be effected except on the basis of the principles of popular government for which the Progressive party stood in 1912. The party, it was stated, would not abandon these principles, but would "follow only a leader who, as we know, stands for them and is able to put them through."

Mr. Roosevelt sent a message of greeting to the conference. He called attention to the world crisis which the country was facing and urged the need of casting aside "all purely partisan considerations" and of disregarding "all but the vital issues affecting the national life." He urged preparedness "to protect our rights against all possible attacks by any aggressors" as "the best guarantee of any honorable peace." Geo. W. Perkins, chairman of the conference and an influential leader in the councils of the party, announced that the reunion of the Progressive and Republican parties did not depend upon the nomination of Mr. Roosevelt. Thus occurred some public expressions and the beginning of a movement which in June made it difficult if not impossible for the Progressives to run Mr. Roosevelt on a third ticket if his leadership were rejected by the Republicans.

The Pre-Convention Contest Within the Republican Party.—Before the opening of the year it was recognized by the Republican leaders and managers that President Wilson was stronger than his party and that the problem of the Presidential contest was how to beat Wilson. In anticipation of the continuance of the European War, the President and his foreign policies, rather than his domestic policies, were to be the principal object of attack. What should be made the paramount issue was a matter of uncertainty and of wide difference of opinion. Many urged the perennial protective tariff, in view of the hard times that had appeared to settle upon the country prior to the opening of the European War. Others urged preparedness and Americanism; Wilson's Mexican policy, or lack of policy; real neutrality; a merchant marine; prosperity and a square deal to business; the war tax; the Panama Canal tolls; and the Progressive platform of 1912 for social justice and industrial amelioration. Amid this diversity of view the consensus of party opinion settled down to a general attack on the failures and inefficiency of the Wilson administration. The hope of success for the opposition lay not in attempting to unify opposition opinion on a positive or constructive programme of any or several of these issues, but in combining all elements of the dissatisfied on any of these accounts in the anti-Wilson cause. The chief problem of the opposition was to prevent the Progressives from running a separate ticket and to induce the rank and file of that party to rejoin the Republican party. In the beginning of the contest, as in its close, it was obvious to the intelligent observer that the farther west one went, the more were the rank and file of the Progressives disposed to assert their independence, and it also seemed evident that if the Old Guard leaders and doctrines entirely controlled the Republican Convention the more likely would that party again suffer defeat in 1916. The question was to what extent the Republican ruling organization would make concessions in leadership and principles to the Progressive demands.

Candidacy and "Keynote" of Mr. Root.—As leading Republican candidates stood Elihu Root of New York, and Justice Charles E. Hughes of the Supreme Court, who were generally regarded throughout the country as of Presidential calibre. Mr. Root had

been Secretary of War, Secretary of State, U. S. Senator from New York, and was recognized as a lawyer, statesman and publicist of international standing. On Feb. 15 he presided as temporary chairman of an official Republican convention of the state of New York at Carnegie Hall in New York City. There he made an address which was generally accepted as a "keynote" of the opposition to the Wilson administration. He laid emphasis on what he regarded as the failure of the Administration's foreign policy, especially on two lines, the Government's course toward Mexico and its policy toward the European War. Mr. Root denounced the President's policy in these respects as "weak, vacillating and stultifying." In Mexico it was, he said, the President's duty, first, to use all his powers to secure protection for the lives and property of Americans in that country and, second, to respect the independence of Mexico and to refrain from all interference with its internal affairs. President Wilson had performed neither of these duties. He had interfered to aid one Mexican faction in civil strife against another. He had ignored and condoned the murder of American men, the rape of American women, the destruction of American property. More than 50 American soldiers in uniform and on duty had been shot and killed and wounded across the border by soldiers of one or the other Mexican factions, and no attention had been paid to their wrongs by the American Government. While ignoring these assaults on American rights and property President Wilson had virtually made war on Mexico, ostensibly to secure reparation for an insult to the American flag, but actually in order to support the faction against Huerta, the man who wielded the *de facto* power in that country. In respect to the European War Mr. Root arraigned the Administration because it had not been following the path of peace. It had been brave in words but irresolute in action. Mr. Root brought a terrific indictment against the German invasion of Belgium, and arraigned the Administration of President Wilson for attempting to be "neutral between right and wrong, between justice and injustice, between humanity and cruelty, between liberty and oppression." President Wilson should have allowed the voice of America to be heard in the case of violated Belgium. "We have been blindly stumbling," said Mr. Root,

> along the road that, continued, will lead to inevitable war. Our diplomacy has dealt with symptoms and ignored causes. The great decisive question upon which our peace depends is the question whether the rule of action applied to Belgium is to be tolerated. If it is tolerated by the civilized world this nation will have to fight for its life. There will be no escape. This is the critical point of defense for the peace of America.

In April 70 men of national distinction and influence signed a statement declaring their preference and support of Mr. Root for the Presidency. His February address was looked upon as the most effective arraignment of President Wilson's administration so far presented. However, it became apparent that its author had little chance of being nominated. His name recalled old sores, and he was not likely to prove acceptable to the Progressives whose support was essential to success. The part Mr. Root had played as the presiding officer in the notorious Republican Convention of 1912, in which the Progressive Republicans had been "robbed" of the control which they had earned in the primaries, made him unacceptable. Leading Progressives publicly announced that as between Mr. Root and Mr. Wilson they would vote for Wilson.

Mr. Hughes and the Pre-Convention Campaign.—The name of Justice Charles E. Hughes of the Supreme Court was constantly being mentioned in the newspapers as a probable and desirable Presidential candidate for the Republicans. Evidence appeared early in the year that there was an organized movement to bring about his nomination. Behind it were an influential body of men in New York, led by Governor Whitman, who were opposed to or who did not believe in the availability of Mr. Root or Mr. Roosevelt. C. Bascom Slemp, a member of Congress from Virginia, received a letter indicating a concerted movement in this direction. Mr. Slemp wrote to the Justice and in-

quired about his attitude toward the nomination. Justice Hughes replied:

> I am entirely out of politics, and I know nothing whatever of the matters to which you refer. I am totally opposed to the use of my name in connection with the nomination and selection or instruction of any delegates in my interest, either directly or indirectly.

On a previous occasion he had said, in substance, that the

> Supreme Court must not be dragged into politics, and no man is as essential to his country's wellbeing as is the unstained integrity of the courts. A political party may undertake to capitalize the judicial decisions of its candidate, than which nothing could be more deeply violative of the spirit of the judicial institution.

Such, according to his close friend Rabbi Wise, had been Justice Hughes' position when he had been urged amid the party struggle of 1912 to allow his name to be used as a candidate for the Presidential nomination.

This position of Justice Hughes was generally commended, but it had no effect whatever upon the organized movement for his nomination. His name would not down; his words were merely taken to mean that he was not a candidate, that neither he nor his friends would enter the political "game," or contest, for the nomination. He had not said that he would not again enter politics nor accept the nomination if it were offered him. But the fact that Mr. Hughes was a member of the Supreme Court, which was supposed to be entirely divorced from politics; that his opinions on the political issues of the day were not known and could not properly be expressed; the feeling that his successful nomination and election to the Presidency might tend to create political ambitions in the members of the Court and that their opinions and decisions might be thereby influenced as a means of winning popular favor; these considerations became a handicap to the candidacy of Mr. Hughes. On the other hand, from the party point of view, his candidacy presented the advantage of bringing forward a man who for the previous six years of strenuous and fatal party divisions had been entirely divorced from politics, and whose opinions on the decisive issues were entirely unknown. This made him all the more available in the minds of many politicians and cautious voters. It was contended that Hughes would reconcile the Progressives and reunite the party. Attention was called to the fact that in 1908, while declining to take any part in promoting his own candidacy for a nomination, he had said that such a matter was one for the party to decide; that by such a nomination an obligation of service would be imposed and that he would be content with the decision. On the other hand, the chief obstacle to the nomination of Mr. Hughes lay in the fact that the prime issues in the election were likely to turn on questions of foreign relations and that the country did not know and had no means of learning what Mr. Hughes' opinions and policies would be in the impending crisis in American affairs. It was urged that the people had a right to know how a Presidential candidate stood on the pressing questions of the day, and that if Justice Hughes intended to allow himself to be nominated, he ought to resign and make known beforehand for what principles and policies he proposed to stand.

The strength of the movement for Hughes lay in the facts of the general recognition of his personal fitness, that he had made an excellent record as governor of New York, and that he would likely be acceptable to the Progressives and thus could reunite the party. No one raised objections to him personally, but as a rule there was no particular enthusiasm for him among the rank and file of the voters. Those who favored him sought to have the people think of him not as a judge but as a governor of New York who had had the soundness and courage to oppose forces that deserved to be defeated.

Mr. Roosevelt and the Presidential Nomination.—On March 9 Mr. Roosevelt gave out a statement on the Presidential nomination from Trinidad, in the British West Indies, to a correspondent of the New York *Evening Mail*. The occasion calling forth the statement was an effort then being made in Massachusetts to elect Roosevelt delegates to the Republican National Convention. The substance of the statement was as follows:

I will not enter any fight for the nomination and I will not permit any factional fight to be made in my behalf. Indeed, I will go further and say that it would be a mistake to nominate me unless the country has in its mood something of the heroic, unless it feels not only like devoting itself to ideals, but to the purpose measurably to realize those ideals in action.

Mr. Roosevelt then spoke of the crisis in the nation's history, and the need of clarifying and defining our policies,—"a crisis so grave it is impossible too greatly to magnify the needs of the country or too strongly to dwell on the necessity of minimizing and subordinating the desires of individuals." This utterance of the ex-President indicated the purpose, not of making the opposition to President Wilson in the campaign center about any man or mere negative protest or fault-finding against the Administration, but that it should represent decisive policy and constructive action.

Within the area of practical politics it had become a question whether Mr. Roosevelt should again be nominated by the Republican party. Mr. Roosevelt's articles in current issues of the *Metropolitan Magazine* called public attention to his political ideas and the policies he would favor if he were in power. In May he clearly defined these policies in an address on "National Duty and International Ideals" before the Illinois State Bar Association. His declaration for a universal system of military service was greeted by an ovation. Roosevelt made it clear that while he was now championing the cause of preparedness he would not forget the programme of social justice projected by the Progressives of 1912. He declared for preparedness of body and soul, not only military but industrial and social. The whole question of preparedness was in Roosevelt's view bound up with the vital issue of "Americanism."

Not only questions of elective and legislative machinery, but all questions of internal reform must stand second to our insistence that this is one nation, the American nation, not a mere tangle of quarreling nationalities, and second also to the duty of facing the fact that at present all moral sanctions and standards in international relations are imperiled and that our prime duty is to fit ourselves to defend the lives of our people and the honor and vital interest of this nation.

Mr. Roosevelt's speeches and agitation were an effective force in pushing forward the issue of preparedness and Americanism.

The Presidential Primaries.—The contest for the Presidential nomination was such that the Presidential-preferential primaries were rendered next to useless. There was no contest against President Wilson within the Democratic party. On the Republican side, Hughes' name, both because of his public utterance and his position on the bench, could not be submitted to the voters in a primary. Root showed no popular strength west of New York, while Roosevelt had forbidden any primary contest to be made for him. This reduced the primary voting to complimentary expressions for "favorite sons," none of whom did much more than carry a plurality in their respective states, some of them not even doing that. Senator Smith of Michigan had announced himself for the support of that state, but Henry Ford carried the Michigan Presidential primary, though he was not an avowed candidate and had spoken of his candidacy as "a joke." Mr. Ford also came near to carrying the Republican primary in Nebraska, largely because of the opposition of Nebraska farmers to war. Other men who were utterly unknown to the country at large were voted for for President or Vice-President. Thus, because of the special circumstances of the time or from the lack of real contest, the Presidential primaries fell into disrepute, and gave no aid and pointed to no conclusion in nominating the Presidential candidates.

The Republican National Convention and Mr. Roosevelt.—The Republican National Convention assembled in the Coliseum in Chicago on June 7 without the country's having decisively indicated the man to be nominated. There had been no popular votes as in 1912, for the convention to accept or defy. The delegates were to "deliberate" and to choose the best available man. They were mostly "hand picked," that is, they were carefully selected men who were known as "regulars" in the Republi-

can party. There were among them some former Progressives who had returned to the Republican party since 1912, some of them since 1914. But these were in a very small minority, and most of the delegates were regarded by those Progressives who were still unreconciled as "standpatters" and "reactionaries," or as delegates who were representative of the "Old Guard" organization, of the men who had secured control of the party organization by questionable means in 1912 and had retained that control without much modification.

But the decision was not entirely to depend upon the personal choice of these elements. They wished to win. They would not care, therefore, to ride rough-shod over the Progressives nor to disregard Progressive feeling, since the one thing essential to party success in the election was so to reconcile the separated party forces as to prevent the nomination of a separate Progressive ticket. The Republican managers were shrewd politicians who were constantly alert to public sentiment. If these "Old Guard" delegates had chosen a man after their own desire, it would have been some "safe" man, not venturesome but easily controlled. They realized that this was "no year for a two spot." Nevertheless, it was evident that the delegates were under skillful management; they were like "old war horses" under control and were not likely to be "stampeded." No shouts, or excitement or hysteria, were likely to shake them from their base to accept a candidate whose regularity was not approved. They were determined not to turn the party and its leadership over to Roosevelt. To that they would prefer the reëlection of Wilson. It was this situation, in part, which made Mr. Roosevelt impossible as the Republican nominee. The problem before the Republican Convention was to find a way to reject the candidacy of Mr. Roosevelt and at the same time offer a nominee who would attract the bulk of the Progressive vote.

The Progressive Convention.—Meanwhile the Progressive Convention was sitting in the Auditorium, an adjoining hall in Chicago, through four days of shouting, uproar and tumult. The majority of the delegates never wavered in their allegiance to Roosevelt, nor for a moment considered any other candidate, unaware of the hopelessness of their cause against the plans of their leaders and managers, who, as the sequel showed, were forced to steer a course designed to reconcile the Progressives to the choice of the Republicans. The true Progressive delegates who distrusted the Republicans and who cared more for their cause than they cared to win the election by being reconciled with or reabsorbed in the old party, were anxious to nominate Roosevelt and adjourn, putting before the Republicans the alternative of accepting this candidate or facing defeat. But it must have been obvious to the knowing ones that there never was a moment after the Republican Convention assembled when there was the slightest possibility that that Convention would accept Mr. Roosevelt as the Republican nominee. The problem of the joint Republican-Progressive managers was so to shape things as to make possible the nomination of Justice Hughes by the Republicans with the maximum of party harmony. The threat of the Progressive Convention to force the nomination of Roosevelt by the Republicans was therefore unavailing. It was impotent for another reason, because the Republican managers knew from Roosevelt's letters and speeches that if the Republicans declared themselves squarely on Americanism and preparedness and put up a fit nominee, Roosevelt would not enter the Presidential contest as the leader of a third party. All that Mr. Roosevelt, Mr. Perkins and the Progressives, whose primary purpose was to defeat Wilson, could hope to get from the Republicans was an outspoken platform and a high-class nomination like that of Justice Hughes.

The Progressive Convention proposed a conference with the Republicans through a joint committee, and this invitation the Republicans accepted. In this conference the Republicans at first had no candidate to suggest, and they presented no arguments against the candidate (Roosevelt) presented by the Progressives. At a later conference the Republican conferees asked if the Progressives would accept Mr. Hughes, to which

the Progressives did not consent. The Republican conferees, therefore, reported to their Convention without comment, favorable or unfavorable, that the Progressives offered Theodore Roosevelt as the candidate on whom the two parties could unite. The same report was made by the Progressive conferees to their Convention. The Progressive Convention went on singing and cheering and shouting their slogan: "We want Teddy," and between times, discussing their platform or announcement of principles. It was a soulful convention of devoted enthusiasts, waiting for the nomination they so ardently desired in the belief that Roosevelt was advising patience. On Friday, June 9, word came that the Republicans had balloted twice and adjourned without making a nomination. On Saturday morning, June 10, the hope of a united nomination was gone; the Republicans would not have Roosevelt. But a message came from Mr. Roosevelt to the two Conventions suggesting the name of Senator Lodge of Massachusetts as a compromise candidate. If this suggestion had been made three or four days sooner, by Roosevelt as representing his followers, it might have had effect among the Republicans, although it is not likely that Lodge's name would have been received favorably by the Progressives. But in any case it was now too late. Geo. W. Perkins, chairman of the Progressive National Committee, still advised for the Progressives a policy of delay, but John M. Parker of Louisiana, who had labored devotedly to build up a new national party in the South, protested against inaction in the face of impending danger. The Republicans had again begun to ballot; it was now certain that they would soon nominate Justice Hughes. The name of Roosevelt was placed before the Progressive Convention and he was acclaimed by a unanimous shout the Progressive nominee, about "thirty seconds" before Hughes was nominated in the Republican Convention (June 10). With a view to promoting a national party in the South and reuniting the two sections, John M. Parker was nominated on the Progressive ticket for Vice-President.

Then a sudden blow came to Progressive hopes. The delegates were about to adjourn when the chairman of the Convention, Raymond Robins, announced a telegram from Mr. Roosevelt:

> I am very grateful for the honor you confer upon me by nominating me as President. I cannot accept it at this time. I do not know the attitude of the candidate of the Republican party toward the vital questions of the day. Therefore, if you desire an immediate decision, I must decline the nomination. But if you prefer it, I suggest that my conditional refusal to run be placed in the hands of the Progressive National Committee.
>
> If Mr. Hughes's statements when he makes them shall satisfy the Committee that it is for the interest of the country that he be elected, they can act accordingly and treat my refusal as definitely accepted. If they are not satisfied they can so notify the Progressive party and at the same time they can confer with me and then determine on whatever action we may severally deem appropriate to meet the needs of the country.

This was like a death blow to the Progressive party. Instead of devotion and courage there came darkness and despair. Some were ready to weep in sorrow and disappointment; some were too angry to speak; some turned to denounce the leader whose praises they had been singing. Ida M. Tarbell, a spectator, expressed the resentment many felt at the tragic fiasco of the Progressive Convention:

> It was a great and noble-hearted body, and its tremendous fight deserved a better end than the cowardly stab its leader gave it in the message which its chairman mercifully and wisely withheld until almost the moment of adjournment.

The Republican and Progressive Platforms.—Platforms have in later days been looked upon as nets to catch votes, or like the platform of a train, as something "to get in on, not to stand on." With the rapid changes of events in the campaign the voters lost sight of the formal party declarations. But these declarations stand on record in history as the official voice of the party and from the historic standpoint they assume importance.

The Republican platform declared for the following:

> (1) The protection of all American rights, at home and abroad, by land and sea. This sacred duty had been neglected by a Democratic President and a Democratic Congress.
>
> (2) A strict and honest neutrality in the great European War. We must per-

form all our duties and insist upon all our rights as neutrals, without fear or favor. The Democrats had resorted to shifty expedients, to phrase-making, to performances in language only.

(3) The pacific settlement of international disputes and the establishing of a world court for that purpose.

(4) Sympathy for Mexico in its devastated condition. There followed a vivid description of the horrors and outrages and banditry existing there. The platform denounced "the indefensible methods of interference by this Administration in Mexican internal affairs" and "the shameful failure to discharge the duty of this country as the next friend to Mexico," and the party pledged its aid in restoring order and maintaining peace in that country.

(5) Approval of the Monroe Doctrine and its maintenance.

(6) Closer commercial, financial, and social relations with Latin America.

(7) Renewal of allegiance to the Philippine policy of Presidents McKinley, Roosevelt and Taft. Attention was called to the great improvement in the islands under American rule. Our task is but half done and our duty to civilization there must be maintained. The proposed Democratic abandonment of the Philippines was denounced.

(8) To secure with Russia (for Russian Jews) the right of expatriation. The right of asylum in America would be maintained.

(9) Preparedness for complete national defense by a sufficient and effective Regular Army and a well-equipped Navy.

(10) The policy of tariff protection, adjusted to prevent undue exactions by monopolies or trusts. The Underwood Tariff was denounced as "a complete failure in every respect." Under normal conditions prior to the war it had been demonstrated that under it American wage earners were unable to meet their foreign competitors; nor had it in the least degree reduced the cost of living.

(11) Rigid supervision and strict regulation of transportations and great corporations. The Republican party would encourage American business and advance American interests.

(12) An effective system of rural credits, as opposed to the ineffective law of the Democratic Administration.

(13) Extension of the rural free delivery.

(14) A ship subsidy for building up a merchant marine, to enable Americans to compete for the ocean-carrying trade.

(15) Complete Federal control of interstate and intrastate transportation.

(16) Economy in administration and a national budget.

(17) Conservation in a careful husbandry of all natural resources.

(18) An honest enforcement of civil-service reform; an indictment of the Administration for gross abuses in this respect.

(19) Vocational education and full protection for labor; a child-labor law; a comprehensive workmen's-compensation law.

(20) Extension of suffrage to women, but recognising the right of each state to settle this question for itself.

The Progressive platform differed from the Republican more in form than in substance. It was more unequivocal and outspoken on the former issues of progressivism, touching woman suffrage and industrial and social needs, but emphasis was placed, as Mr. Roosevelt had been placing it, on preparedness, calling for "a Navy restored to at least second in rank in battle efficiency and a regular army of 250,000 men," and for universal military training in time of peace. The two platforms agreed on a firm policy in Mexico, a protective tariff, a tariff commission, an American merchant marine, a national budget system, and Federal child-labor and workmen's-compensation laws.

Justice Hughes' Acceptance.—Immediately upon his nomination Justice Hughes resigned from the Supreme Court and sent by telegraph to Warren G. Harding, chairman of the Republican Convention, his acceptance of the nomination in a public statement of considerable length. He said he had not desired the nomination but preferred to remain upon the bench; but he recognised the right of the Convention to summon him and his paramount duty to respond. There was a national exigency transcending partisan considerations.

> You voice the demand for a dominant thoroughgoing Americanism with firm protective upbuilding policies essential to our peace and security, and to that call in this crisis, I cannot fail to answer with the pledge of all that is in me to the service of our country. Therefore, I accept the nomination.
>
> I stand for the firm and unflinching maintenance of all the rights of American citizens on land and sea. . . . Our foreign relations have suffered incalculably from the weak and vacillating course which we have taken with regard to Mexico, a course lamentably wrong with regard both to our rights and our duties.

He indicted the Wilson Administration for subordinating our diplomatic intercourse to partisan requirements, and declared that belated efforts had failed to recover the influence and prestige which had been so unfortunately sacrificed. Brave words had been stripped of their force by indecision. He avowed his purpose, when elected, to bring the best ability of

the country into the diplomatic service; to maintain firmly American rights under international law; and to dignify American standing among the nations. He would stand for a united country, a single-hearted patriotism. "Whether native or naturalized, of whatever race or creed, we have but one country and we do not for an instant tolerate any division of allegiance." He declared for "adequate preparedness" in Army and Navy, but with devotion to the ideals of honorable peace, and the just settlement of all international disputes, with no policy of aggression, no lust for territory, no danger of militarism, with industrial and economic preparedness as well as military. "Our severest tests will come after the war," he said, and therefore,

we must make a fair and wise readjustment of the tariff in accordance with sound protective principles to insure our economic independence and to maintain American standards of living. We must conserve the just interest of labor, realizing that in a democracy patriotism and national strength must be rooted in even-handed justice. In preventing, as we must, unjust discriminations and monopolistic practices, we must still be zealous to assure the foundations of honest business. Particularly should we seek the expansion of foreign trade, and we must not throttle American enterprises here or abroad.

He would stand for the merit system in the civil service in all departments of the Government. He accepted the nomination with a deep sense of responsibility, pleading that former difference within the party might be forgotten "and that we may have united effort in a patriotic realization of our national need and opportunity."

Roosevelt Urges the Progressives to Support Hughes.—At the close of the Progressive Convention in Chicago, a meeting of the National Committee was called to be held in Chicago on June 26. Under date of June 22 Mr. Roosevelt sent to the Progressive National Committee a letter giving his reasons for declining the Progressive nomination. He recalled the convention of 1912 and its platform, "much the most important public document promulgated in this country since the death of Abraham Lincoln. . . . The first effort on a large scale to translate abstract social formulae of economic and social justice into concrete American nationalism." Two years of the world war had shown the need in this nation of spiritual and industrial preparedness along the lines of efficiency and loyal service,

the only sound basis for that indispensable military preparedness which rests on universal military training, and which finds expression in universal obligatory service in time of war. Such universal obligatory training and service are the necessary complements of universal suffrage and represent the realization of the true American democratic ideal in both peace and war.

Roosevelt pledged himself to continue to work shoulder to shoulder for the Progressive ideals of 1912 with the men and women who championed them then and who would show like loyalty to the "fundamental ideals which the events of the past two years have proven to be vital to the permanency of our national existence." While progressive ideals had been advanced by the Progressive party, it was evident that "the people under existing conditions are not prepared to accept a new party." Progressives should not abandon their convictions, but it was evident that their party national organization was no longer the means by which these convictions can be made effective in our national life. It was clearly evident too, that the coming Presidential election would result in the choice of either the Republican or the Democratic nominee. Therefore, the duty of Progressives was to get the best that the situation could be made to yield from the standpoint of the nation as a whole, and not to sulk merely because their leadership was rejected.

Roosevelt arraigned the Wilson administration, than which "no administration in our history has done more to relax the spring of the national will and to deaden the national conscience." It was therefore the duty of Progressives "to do everything short of sacrificing our most sacred convictions in order to secure the alignment under one leadership of the forces opposed to the continuance in power of Mr. Wilson and the Democratic party." Some Republicans had charged that in making his earlier statements in favor of a reunion in opposition to Wilson, Mr. Roosevelt was not acting in good faith. This charge Mr. Roosevelt resented, and he

claimed that his utterances should be taken "at their exact face value as meaning that if the Republicans nominated a man whom we could conscientiously support, we would support him." The Progressive Convention came together knowing these public statements and this public attitude of Mr. Roosevelt. Mr. Roosevelt then gave it as his judgment that the nomination of Mr. Hughes met the conditions set forth in his own utterances and in the statement of the Progressive National Committee in January. Satisfied with Mr. Hughes as a dependable candidate whose public record was satisfactory, Mr. Roosevelt opposed the policy of having a third ticket and he declined the nomination on such a ticket. He would do what he could in support of Mr. Hughes.

Mr. Roosevelt spoke in stern reprobation of the professional German-American element in American politics, the element typified by the German-American alliances and the similar bodies which had in the pre-nomination campaign played "not merely an un-American but a thoroughly anti-American part." These elements, he said, had favored Hughes for the nomination not because of any liking for Hughes, but because of their antagonism to Roosevelt.

> No good American whatever his ancestry or creed can have any feeling except scorn and detestation for those professional German-Americans who seek to make the American President in effect a viceroy of the German Emperor. The professional German-Americans of this type are acting purely in the sinister interest of Germany. They have shown their eager readiness to sacrifice the interest of the United States whenever its interest conflicted with that of Germany. They represent that adherence to the politico-racial hyphen which is the badge and sign of moral treason to the republic.

Mr. Roosevelt's letter closed with an appeal to Progressives to consider, not their own political fortunes, but the honor and welfare of the people of the United States. Hughes was safe and efficient, an unfaltering opponent of "invisible government," of the boss and the machine, while Wilson had put "safety first" before "duty and honor." He earnestly urged his fellow Progressives to give their ungrudging support to Hughes.

Hughes Appeals for Progressive Support.—Mr. Hughes promptly expressed to Mr. Roosevelt his appreciation of this endorsement. He recognised the debt of the nation to Mr. Roosevelt for "the quickening of the national spirit for the demand of an out-and-out Americanism, and for the insistence upon the immediate necessity of a thoroughgoing preparedness, spiritual, military, and economic." To this end Mr. Hughes appealed for a united party reconsecrated to its loftiest ideal. He and Mr. Roosevelt were in entire accord:

> You have sounded forth the trumpet that shall never call retreat. And I want you to feel that I wish to have all the aid that you are able and willing to give. I want the most effective coöperation with all those who have been fighting by your side. Let us work together for our national security and for the peace of righteousness and justice.

Mr. Hughes also telegraphed the Progressive National Committee accepting its support. In this letter he expressed the conviction that by prompt and decisive action the *Lusitania* tragedy would have been prevented, and he held the Administration responsible for the use of our soil as a base of alien intrigues. He used Secretary Lansing's note to Carranza describing the lawless conditions in Mexico (see III, *International Relations*) as an indictment of Wilson's Mexican policy by the Administration itself. He expressed his desire to improve the conditions of labor, to protect women and children, to conserve natural resources, and to lay underneath every effort to promote social justice "a stable foundation for honorable enterprise." He deemed it vain to look to the Democratic party to promote a constructive programme on which American security and prosperity must depend.

> That party had not the national outlook. . . . We must make the Republican party the instrument of our advance. We want deeds, not words. The Progressives have insisted on responsible, not invisible government, on efficient administration. I yield to no one in that demand. . . . I find no difference in platform or in aim which precludes the most hearty coöperation and the most complete unity. It is within the party that the liberalizing spirit you invoke can have the widest and most effective influence.

The Renomination of President Wilson.—There was no pre-convention contest within the Democratic party. Before the year opened it was evident that there would be no opposition within his party to the renomination of President Wilson. In 1912 Mr. Wilson accepted the Democratic nomination on a platform that declared in favor of a single Presidential term; "to that end," said the platform, "we urge the adoption of an amendment to the Constitution, making the President of the United States ineligible for reëlection, and we pledge the candidate of this convention to this principle." Mr. Wilson had not endorsed this proposal. In a notable letter which he wrote early in 1913 to A. Mitchell Palmer, of Pennsylvania, a member of the Democratic National Committee, which was not given to the public until January, 1916, Mr. Wilson stated the belief that "a fixed constitutional limitation to a single term of office is highly arbitrary and unsatisfactory from every point of view." While he was willing to see "the present customary limitation of two terms put into the Constitution if you do not trust the people to take care of themselves," giving "the President a chance to win its full service by proving himself fit for it," he insisted that "we singularly belie our own principles by seeking to determine by fixed constitutional provision what the people should determine for themselves and are perfectly competent to determine for themselves." The President disclaimed having in view his own renomination. "I absolutely pledge myself," he said, "to resort to nothing but public opinion to decide that question. The President ought to be deprived of every other means of deciding his renomination," evidently referring to the influence of patronage and "pork." It was thus made evident that Mr. Wilson would not permit himself to be bound by a blundering declaration of his party platform of 1912.

President Wilson's Policy on Preparedness and Americanism.—Within the six months preceding his nomination, President Wilson had occasion to set before the country his attitude on some of the pressing questions that had arisen during his administration. The last week in January he started on a tour to give a series of public addresses in the interest of preparedness, and to arouse public sentiment for the defense programme in Congress (see *Congress and the Administration, supra*). By these addresses the President largely forestalled attack by his political enemies on the issue of preparedness, though he confessed that he had changed his mind on the subject within the preceding fourteen months and his political opponents charged that he had been forced to his new position by the leadership and stirring appeals of others, and notably by the constant and strenuous attacks of ex-President Roosevelt on this subject. On the issue of American rights and the European War, he set forth his position in a letter to Senator Stone of Missouri under date of Feb. 14, 1916, called out by the threatened resolutions in Congress warning against or forbidding Americans to travel on passenger ships belonging to citizens or subjects of the belligerent nations (see *Congress and the Administration, supra;* and III, *International Relations*). This letter made it clear that the President intended to uphold the dignity and rights of the United States. He insisted that the issue raised by the Gore and McLemore resolutions should be met directly by a straightforward vote, and the stand-up fight cleared the atmosphere in Congress and strengthened the President with the country. It placed him in undoubted control of Congress and put him into the position of not merely passively awaiting the action of Congress to be met with his approval or disapproval, but rather into the position of a party leader and law-giver whose policies and leadership could be rejected by his party followers only at the expense of party weakness or disruption (see *Congress and the Administration, supra*). The way was thus made easier for the success of the President's complete programme of legislation. The President's open fight against the surrender by Congress of the rights of American citizens to travel on the high seas also revealed a division and a weakness within the

Republican ranks in Congress. It was shown that the majority of the Republican members of the House were unwilling to stand up for the assertion of American rights, as 102 Republican members voted for the McLemore resolution.

The Democratic Convention.—The Democratic National Convention which opened at St. Louis on June 14 was united and harmonious. It was a great ratification meeting full of enthusiasm, hope, and confidence, having before it merely the task of listening to party speeches, rallying the party spirit, adopting a declaration of principles, and announcing the renomination of the President which the Democratic forces of the country had already settled upon. Barring the negative of one Tammany delegate, the ticket of 1912 was renominated on June 15 by acclamation: Woodrow Wilson of New Jersey for President, Thomas R. Marshall of Indiana for Vice-President.

The Democratic "keynotes" for the contest were sounded in the Convention by the temporary chairman, ex-Governor Glynn of New York, and the permanent chairman, Senator Ollie James of Kentucky. The issue of the campaign was to be the record of the Wilson administration. Governor Glynn spoke strongly for a sound military preparation. If any nation committed aggression against rights and interests he would meet that aggression with preparedness and courage. He recited with power the process by which Wilson's policy of negotiation had won success, and he cited notable cases in American history to show that negotiation and not war had been the patriotic policy of every great President.

This policy may not satisfy those who revel in destruction and find pleasure in despair. It may not satisfy the fire-eater or the swashbuckler. But it does satisfy those who worship at the altar of the God of Peace. It does satisfy the mothers of the land, at whose hearth and fireside no jingoistic warfare has placed the empty chair. It does satisfy the daughters of the land, from whom brag and bluster have sent no loving brother to the dissolution of the grave. It does satisfy the fathers of the land and the sons of the land who will fight for the flag and die for the flag when reason primes the rifle, when honor draws the sword, when justice breathes a blessing on the standards they uphold.

At this passage a burst of spontaneous applause arose from the convention and the orator had to repeat and rerepeat the passage.

Senator James uttered the same note in commendation of Wilson, extolling particularly his patience and negotiation in the German crisis.

Without orphaning a single American child, without widowing a single American mother, without firing a single gun, or shedding a drop of blood, Woodrow Wilson wrung from the most militant spirit that ever brooded over a battlefield a recognition of American rights and a concession to American commands.

Senator James also reviewed and eulogized the domestic policies of the Administration. Senator Lewis of Illinois, Senator Reed of Missouri and Wm. J. Bryan also spoke in the same vein and the Convention was turned into a season of a shouting and harmonious party revival.

The Democratic Platform.—The Democratic platform endorsed the Administration of Wilson, which "speaks for itself" as "the best exposition of sound Democratic policy at home and abroad." It challenged comparison of the party's record, its keeping of pledges, its constructive legislation "with those of any party at any time." It reviewed the record of the past three years:

The Federal Reserve Act, "a true democracy of credit under Government control, mobilizing our resources and making a currency panic impossible"; the creation of a Federal Trade Commission, "that monopoly may be strangled at its birth and legitimate industry encouraged"; the adjustment of the tariff, "adequate for revenue under peace conditions, fair to the consumer and to the producer"; adjustment of the burdens of taxation, "so that swollen incomes bear their equitable share"; lifting "human labor from the category of commodities," securing to the workingman the right of voluntary association and protecting him against unwarranted writs of injunction; advancing the parcel post to genuine efficiency, enlarging the postal savings system, adding 10,000 rural delivery routes, improving the postal service and placing it for the first time in our history on a self-supporting basis.

The platform reasserted the Monroe Doctrine; declared that American troops must remain in Mexico (see III, *International Relations;* and XII, *The Army*) till border incursions by Mexican bandits became improbable; favored improved labor conditions in Government employment, and as an example of the means of conserving the life, health and strength of the men, women and children of the nation, would have the party and the Government put into effect a living wage, the eight-hour day and one day's rest in seven, safety appliances and sanitary conditions, adequate compensation for industrial accidents, a uniform child-labor law, and an equitable retirement law; endorsed the Shipping bill (see XX, *The Merchant Marine*) and the child-labor bill (see XV, *Child Labor*) then before Congress; endorsed the principle of ultimate independence for the Philippines Islands (see *Congress and the Administration, supra*); and approved suffrage for women to be extended by the several states.

On the subject of military preparedness, the European War, American rights and duties abroad, the platform declared:

We, therefore, favor the maintenance of an army fully adequate to the requirements of order, of safety, and of the protection of the nation's rights, the fullest development of modern methods of seacoast defense and the maintenance of an adequate reserve of citizens trained to arms and prepared to safeguard the people and territory of the United States against any danger of hostile action which may unexpectedly arise; and a fixed policy for the continuous development of a navy worthy to support the great naval traditions of the United States, and fully equal to the international tasks which the United States hopes and expects to take a part in performing.

We believe that every people has the right to choose the sovereignty under which it shall live, that the small states of the world have a right to enjoy from other nations the same respect for their sovereignty and for their territorial integrity that great and powerful nations expect and insist upon, and that the world has a right to be free from every disturbance of its peace that has its origin in aggression or disregard of the rights of people and nations; and we believe that the time has come when it is the duty of the United States to join with the other nations of the world in any feasible association that will effectively serve these principles, to maintain inviolate the complete security of the highway of the seas for the common and unhindered use of all nations.

We again declare the policy that the sacred rights of American citizenship must be preserved at home and abroad, and that no treaty with any other government shall receive the sanction of our Government which does not expressly recognize the absolute equality of all our citizens, irrespective of race, creed or previous nationality, and which does not recognize the right of expatriation.

The American Government should protect American citizens in their rights, not only at home but abroad, and any country having a Government should be held to strict accountability for any wrongs done them, either in person or property.

On unpatriotic alienism in America and the threat of the German alliances and "hyphenates" to punish the Administration for its conduct of diplomacy during the strained relations that had arisen with Germany, the platform was especially emphatic:

We, therefore, condemn as subversive of this nation's unity and integrity, and as destructive of its welfare, the activities and designs of every group of organization, political or otherwise, that has for its object the advancement of the interest of a foreign power, whether such object is promoted by intimidating the government, a political party, or representatives of the people, or which is calculated and tends to divide our people into antagonistic groups, and thus to destroy that complete agreement and solidarity of the people and that unity of sentiment and national purpose so essential to the perpetuity of the nation and its free institutions.

The platform concluded:

Upon this record of the past, upon the great policies for the future, the enlargement of our national vision, the ennobling of our international relations, as set forth above, we appeal with confidence to the voters of the country.

Mr. Hughes' Speech of Acceptance. —On July 31, in New York, Mr. Hughes was formally notified of his nomination and made his speech of acceptance setting forth the issues on which he proposed to conduct his campaign. He expressed his desire to see the Republican party become "a great liberal party, the agency of national achievement, the organ of effective expression of dominant Americanism." He spoke of his ideal for America,

conscious of power, awake to obligation, erect in self-respect, prepared for every emergency, devoted to the ideals of peace, instinct with the spirit of human brotherhood, safeguarding both individual opportunity and the public interest, maintaining a well-ordered con-

stitutional system . . . , a country loved by its citizens with a patriotic fervor permitting no division in their allegiance and no rivals in their affection,—I mean America first and America efficient. It is in this spirit that I respond to your summons.

Mr. Hughes condemned the Administration's dealings with Mexico as a confused chapter of blunders. As to the difficulties with Germany, he complained of an indisposition to back words with deeds. He denounced plots and conspiracies in America in the interest of any foreign nation; asserted that the nation was shockingly unprepared; insisted upon an increase in the Regular Army and that the first citizen reserve subject to call should be enlisted as a Federal army and trained under Federal authority; declared for international organization for international justice and to safeguard world peace, for international tribunals to decide controversies susceptible of judicial determination, and to develop the instrumentalities of conciliation; insisted that in industry and commerce Americans were living in a fool's paradise, that "the temporary prosperity to which our opponents point has been created by the abnormal conditions of the war;" promised that the Republican party would stand for the principle of protection, fairly applied without abuses, to safeguard our economic independence, to develop American standards of living; and declared for a merchant marine, for the conservation of the just interests of labor, to better the lives of human beings, for the safeguarding of our future through proper laws for protection of women and children in industry, and for increasing opportunity for education and training. It was a matter of honor for us to maintain our trust in the Philippines and to continue our government and control of the islands in the interest of the Filipino people. Mr. Hughes arraigned the Administration for reckless extravagance:

> They have been wasteful and profligate. It is time that we had fiscal reform. We demand a simple, business-like budget. Through a responsible budget proposed by the Executive we shall avoid financial waste and secure proper administrative efficiency.

Mr. Hughes' acceptance speech made a favorable impression on the country. It was taken as an appeal to the conservative rather than to the radical elements of the electorate. Little attention was given to matters of social justice to which the Progressive movement had been devoted. But Mr. Hughes had already made his personal appeal to Progressives and in his official acceptance of his party's nomination he was cautious and stable, making appeals in broad general terms. The address was criticized by his opponents as lacking in suggestions of definite policies and constructive proposals.

The Candidates and Woman Suffrage.—In Mr. Hughes' acceptance speech he endorsed his party's platform in favor of woman suffrage. The day following this speech Mr. Hughes announced that he unqualifiedly favored the proposed Susan B. Anthony amendment to the Federal Constitution giving to women the right to vote. In this he went beyond his party platform. President Wilson declared for woman suffrage as he had done before, but he let it be known that he had not changed his view as to the method of bringing the reform about, that it should be determined by each state for itself. (See also II, *Woman Suffrage.*)

The Republican Campaign.—The Republican campaign was placed under the management of William R. Wilcox, A. T. Hert being made manager of the Western headquarters, at Chicago. In mid-August Mr. Hughes started on his first speaking trip of the campaign. It occupied a month and took him from coast to coast, into 17 states. On the eve of the trip the Hughes candidacy was given an impetus by the announced support of Raymond Robins, the radical Progressive who had been the chairman of the Progressive National Convention at Chicago. Mr. Robins entered upon an active speaking campaign in support of Mr. Hughes.

Mr. Hughes travelled westward, speaking to large crowds at Detroit, Chicago, Fargo, Helena, Butte. He shook hands generously and "jollied" the crowds, seeking to overcome a reputation that had been made for him for coldness and exclusive manners. He attacked the Wilson administration on grounds of waste, extrava-

gance, "pork" legislation, sectionalism, unfit appointments, violation of sound civil-service principles. He promised reforms in all these respects. Criticisms arose among his opponents that he was scolding and fault-finding but offering no constructive programme. In reply to these criticisms he proposed "protection to American citizens, protection to the property of American citizens, protection to our border from incursions, the rights that we have as one nation relatively to another nation at our doors. . . . We are going to insist that these obligations be performed." He called attention to the "keynote demand" of his party platform for a business-like responsible budget.

Mr. Hughes made numerous other campaign trips on a "Presidential Special," in the East and in the Middle West, repeating his attacks on the Administration. After the passage of the Adamson Eight-Hour Act on Sept. 2 (see *Congress and the Administration, supra*) Mr. Hughes immediately denounced it and pushed it forward as a prime issue in the latter part of his campaign, although a majority of his party members in Congress had voted for the measure. He was charged with dropping the "pivotal issues" with which he had started out for any chance that might arise in any new Wilson policies which might give further ground for criticism and opposition. The only abiding paramount issue on the Republican side seemed to be "anything to beat Wilson."

It appeared that the votes of the German-Americans, who were especially anxious to play politics in America and to use their votes in the interest of Germany, would be cast for Hughes, and repeated efforts were made to draw out the candidate on the German issue. If he were elected by German votes would he be beholden to German interests in his administration? He had committed himself only in general expressions and platitudes about "firmness," "America first," "full guarantee of American rights," "no divided allegiance," etc., and a blanket endorsement of Mr. Roosevelt's speech at Lewiston, Me. (see *infra*). It was not until the week before the election that Mr. Hughes, in answer to hecklers at Columbus, O., and Evansville, Ind., said definitely that he would oppose warning American citizens from travel in merchant ships belonging to citizens of a belligerent country and that he would oppose an embargo on the shipment of munitions from America. A little earlier he had said in answer to a heckler at Louisville, Ky., that, as to the *Lusitania*, if after a warning which "meant precisely what was said," delivered immediately after the publication of the German Ambassador's warning advertisement (*A. Y. B.*, 1915, p. 38), that infamous deed had still been committed, he would have broken off diplomatic relations with Germany. But these utterances, eagerly sought and long awaited, came too late; and they not unnaturally led to the suspicion and opposition charge that they had been withheld as a part of the "game of politics" until the last German-language weekly had gone to press and the un-American German vote had been secured (see also "President Wilson in the Campaign," *infra*).

No doubt Mr. Hughes' campaign was a deep disappointment to independent and non-Democratic voters, and this disappointment led many thousands to vote for Wilson who felt no enthusiasm nor desire to reëlect the President. This tendency among independent voters away from Hughes was indicated by the decision to support Wilson made late in the campaign by such organs of public opinion as the New York *Nation* and the *New Republic*. Hughes found himself much weaker in November than he had been in June. In his speeches there had been a constant monotony of fault-finding and undiscriminating criticism of the Administration and it was "only by shutting one's eyes and ears to what he was doing and saying and firmly fixing one's mind upon the reputation he had won years ago that it was possible to think of him as worthy of the Presidency" (*Nation*, Nov. 30).

Mr. Hughes' Conception of the Presidency.—Mr. Hughes did not look upon the Presidency as an opportunity for leadership and for promoting decision and action on vital public questions. One week before the elec-

tion (Oct. 30) he gave out a statement under the caption "My Conception of the Presidency" in which he summed up what he had stood for in the campaign, the same things he expected to stand for as President. He looked upon the President as primarily an executive officer. It was the President's prime function not to determine policies, not to be a political leader and law-giver of the nation, but to be an administrative head, to attend to the public business and to enforce the laws. This had been Mr. Taft's idea. In this Mr. Hughes differed radically from Mr. Wilson, who looked upon the Presidency as a position of political leadership from which national policies and programmes should be influenced and promoted. The President's first duty therefore, according to Mr. Hughes, was to call about him the ablest Cabinet the country could afford. Mr. Hughes criticized President Wilson's choice of a Cabinet and assured the country that his own would rest on sound administrative ground. The statement concluded thus:

> You ask what road I propose to travel? These are the milestones which mark it: an Executive responsible to the whole nation, a Cabinet chosen from the ablest Americans, a foreign policy that stands courteously but firmly for American rights, a flag that protects the American in his lawful rights wherever his legitimate business may take him, a preparation for trade competition which shall protect all groups of American workmen, a government oversight of business which will fearlessly eliminate abuses, but will act on the assumption that the average business man is honest, and finally a domestic policy which looks to industrial peace, and to sound and permanent prosperity based upon the development of American trade and the building up of American industries.
>
> We Americans are in one boat. You cannot strike a blow at one group without injury to all. Common justice and fair play will settle our difficulties if suspicion and bitterness are let alone. These are the principles by which I propose to be guided.

Roosevelt and Beveridge in the Republican Campaign.—Mr. Roosevelt came ardently to Mr. Hughes' support in an attempt to rally his Progressive following. He made a notable speech in Lewiston, Me. (Aug. 31), containing a scathing review of the Administration. Mr. Roosevelt subordinated all questions of domestic politics to the paramount issue of American honor and prestige in foreign affairs. He declared that the vacillation and timidity of the President had brought disgrace upon the country.

> America as a nation has been kept in a position of timid indifference and cold selfishness. America, which sprang to the succor of Cuba in 1898, has stood a silent spectator of the invasion of Belgium, of the sinking of the *Lusitania*, of the continued slaughter of our own citizens by German submarines, and of the reign of anarchy, rapine, and murder in Mexico.
>
> At this moment Mr. Wilson's buglemen advance as his greatest claim that "he has kept us out of war." This claim can be seriously made only by individuals who endorse President Wilson's belief that deeds are nothing and words everything.
>
> Under President McKinley we had a war with Spain. Under President Wilson we are assured that we have had "peace" with Mexico. These are the words. Now for the deeds. During the war with Spain fewer Americans were killed by the Spaniards than have been killed by Mexicans during the present "peace" with Mexico. Moreover, when the war with Spain was through, it was through. But peace still continues to rage as furiously as ever in Mexico.

In October Mr. Roosevelt entered into active participation in the campaign, speaking in Detroit, Battle Creek, Chicago, Louisville, and in states in the Southwest, reiterating his fierce attacks on Mr. Wilson and his policies. Ex-Senator Beveridge, a prominent Progressive of 1912, opened the campaign in Chicago for the Republicans with an effective speech and he continued his campaign for Hughes to the Northwest.

The Democratic Campaign.—Meanwhile the campaign for President Wilson's reëlection was proceeding along several lines: (1) Perfecting the Democratic organization, raising funds, and rallying the largest possible Democratic vote; Vance McCormick of Pennsylvania was chairman of the National Committee with the campaign in charge. (2) An appeal to the independent voters of the country, who, as a jury, were waiting for the case to be presented; among the most powerful appeals to this vote was an article in the *Atlantic Monthly* for October by Dr. Charles W. Eliot, president emeritus of Harvard University, on "The Achievements of the Democratic Party," which was reprinted and widely circulated

as a campaign document. (3) An effort to attract as large a proportion as possible of the Progressive vote; certain notable and influential Progressives gave their support to the President and urged his reëlection, among them being John M. Parker, the Progressive candidate for Vice-President, Amos Pinchot of Pennsylvania, Francis J. Heney of California, Ida M. Tarbell, Bainbridge Colby of New York, Matthew Hale of Massachusetts, and about 15 members of the Progressive National Committee.

Dissatisfied Progressives.—On Aug. 3 a conference was held at Indianapolis by Progressives, members of the National Committee and others, who were unwilling to support Mr. Hughes. It was reported that 37 states were represented. The conference decided against an attempt to reassemble the National Convention for the purpose of filling the vacancy on the national ticket caused by Mr. Roosevelt's refusal to accept the nomination. But it was decided that an electoral ticket should be put up in every state where there was a nucleus of an organization, this ticket to bear the name of John M. Parker of Louisiana, the nominee for Vice-President. This plan was carried out in a number of states by those Progressives who preferred President Wilson to Mr. Hughes, as an aid in bringing about Wilson's reelection. The Indianapolis conference issued an address "to the Progressives of the country," condemning the action of the Progressive National Committee on June 26 endorsing Mr. Hughes, as "an illegal usurpation of authority not conferred upon it by the recent Convention, as a breach of trust and as non-expressive of the party's thought and wishes." The conference protested "against the treasonable attempt to put the Progressive party out of existence as a national party and to deliver its vote to the Republican party. It was the sense of the Conference that the action of individual Progressives on the Presidency should be left to their individual judgment and conscience. It was apparent that a considerable part of the Progressive vote would go to Wilson as against Mr. Hughes.

President Wilson in the Campaign.—President Wilson did not enter upon a speaking tour of the country in an active campaign before the voters. He made three visits to the Middle West on non-partisan occasions; one to Hodgenville, Ky., to give a memorial address on the occasion of the dedication of a monument at the birthplace of Abraham Lincoln; one to Indianapolis to speak in the interest of good roads and before a body of farmers on the subject of rural credits; and one to Omaha (Oct. 5) in which he spoke for world peace and explained his foreign policy, denying the charge that he had placed peace above honor or that he would have his country indifferent to the moral issues involved in the European War.

The President, also, made a few formal campaign speeches to delegations visiting his summer home, Shadow Lawn, at Long Branch, N. J. On Sept. 2, at Shadow Lawn, he gave his formal address in acceptance of renomination. In this he set forth the record of his Administration and presented his case for the verdict of the country. As a claim for a vote of confidence he summed up promises kept and services rendered:

> The tariff revised, with a Tariff Board "to keep the relations of American with foreign industry under constant observation."
>
> The laws against trusts clarified, directed "not against big business, but unfair business."
>
> The Federal Reserve Act, to supply an elastic currency.
>
> The Rural Credits Act, to create for the farmers commercial credit.
>
> A Warehouse Act, to make standard crops available as security for bank loans.
>
> Emancipation of workingmen, by lifting their labor from being a mere marketable commodity; by restraint on injunction of labor unions; by releasing seamen from involuntary servitude; by provision for compensation for industrial accidents; by supplying suitable machinery for mediation and conciliation in industrial disputes; by governmental good offices to laborers in search of work.
>
> Emancipation of children by a child-labor law.
>
> A system of national aid in the building of good roads.
>
> Equalizing taxation by an equitable income tax.
>
> Driving the tariff lobby from cover, "obliging it to substitute solid argument for private influence."

In foreign relations our guiding principle was that property rights can be vindicated by claims for damages

when the war is over; but loss of life and the violation of the nation's sovereignty cannot await suits for damages. The President defended his action toward Huerta's Government in Mexico; expressed the hope that America would be able to contribute toward world peace, and that his country would not be forced to take sides in a quarrel in which its own honor and integrity and the fortunes of its own people are not involved; expressed his faith that the day of little Americanism had gone, "and that a day of enterprise has at last dawned for the United States whose field is the world." On the subject of hyphenism he said:

> The passions and intrigues of certain active groups and combinations of men among us who were born under foreign flags injected the poison of disloyalty into our own most critical affairs, laid violent hands upon many of our industries and subjected us to the shame of divisions of sentiment and purpose in which America was condemned and forgotten. It is part of the business of this year of reckoning and settlement to speak plainly and act with unmistakable purpose in rebuke of these things, in order that they may be forever hereafter impossible. I am the candidate of a party, but I am above all things else an American citizen. I neither seek the favor nor fear the displeasure of that small alien element among us which puts loyalty to any foreign power before loyalty to the United States.

It was claimed by the anti-British Irish and certain organizations of Germans in America that they had been instrumental in carrying some of the primaries in a way to rebuke the President and his policies—by defeating Robert L. Bacon, of pronounced pro-Ally sympathies, for U. S. Senator in New York and by renominating Senator Martine of New Jersey (in Mr. Wilson's party) who had voted to withdraw protection from Americans on the seas. An anti-British agitator named Jeremiah O'Leary, who had been organizing and speaking against Wilson and trying to array alien votes against him, wrote an offensive letter to the President calling attention to the result of the Maine election and the New Jersey primaries and to his anticipated defeat in November. The President replied:

> I would feel deeply mortified to have you or anybody like you to vote for me. Since you have access to many disloyal Americans and I have not, I will ask you to convey this message to them.

This sharp and timely rebuke to an alien and unpatriotic spirit in America won approval and support for the President. Nothing like this bold defiance of alien influences in American politics came from Mr. Hughes until a few days before the election. Then in one of his New York City addresses, in answer to earnest solicitation, Mr. Hughes said:

> I do not want the support of anyone who has any interest superior to that of the United States. The United States must be supreme. And as to any who would have an allegiance that is not single and complete, as to any who would not instantly champion the rights and interests of America against any country whatever, as to any who would seek immunity for foreign aggression, or who would have the power of this nation held captive to any foreign influence or swerved by alien machinations, let them not vote for me.

The lateness of this utterance seemed to be the only objection to it.

On Sept. 30 President Wilson made his second campaign speech at Shadow Lawn, before the Young Men's League of Democratic Clubs. He attacked the Republican party and asserted that it was destined soon to die as the Federalist and Whig parties had died before it, while the Democratic party had survived from the beginning, because it is "the only party all of whose life had been governed or inspired by a definite principle, an absolute belief in the control of the people." He paid a glowing tribute to the Progressive party and bid for Progressive support:

> You remember that four years ago there was a great body of spirited Republicans who said, "This thing is becoming a fraud and a sham. We have been taking care of some people, but we have not been taking care of the great body of the people. We have not thought about their morals, we have not thought about their health, we have not thought about their rights as human beings, and we insist that you put the policy of this party in our hands, or we will go off and form a party of our own." and thereupon the great Progressive party sprang up—great, not because it turned out to be more numerous than the party from which it had seceded, though it did that, but because it had the real red blood of human sympathy in its veins and was ready to work for mankind and forget the interest of a narrow party. I want to pay my tribute of respect to the purposes and intentions of the men who formed that group in our politics.

The Eve of the Election.—Thousands of hesitating voters remained undecided till the eve of the election. Election calculations could not be safely made. States had to be placed in the doubtful column which party managers had relied on for a generation. Party lines seemed blurred and blotted out. For instance, in Wisconsin, Senator La Follette, who had been the Republican leader in that state for 20 years, while running for reëlection on the Republican ticket, advocated the election of Hughes but praised the policies of President Wilson which he had supported in the Senate. La Follette's Democratic opponent for the Senate, William L. Wolfe, claimed the support of his party adherents on the plea that he was "as good a Democrat as La Follette." In Washington, Senator Miles Poindexter, who had been an ardent Roosevelt Progressive in 1912, was nominated for reëlection on the Republican ticket. He appealed to the people for votes on the ground of his support in the Senate of the Wilson policies. His Democratic opponent, Geo. L. Turner, had been a "stalwart" Republican in earlier days, being one of the "306 immortals" who followed Conkling in the effort to nominate Grant for a third term in 1880. A unique situation in California is discussed later.

The Maine Election.—On Sept. 11 state elections in Maine were carried by the Republicans. The total vote in Maine was the largest ever cast in a state election. The Republican majorities ranged from 9,000 to 14,000, electing a governor to succeed a Democrat, two U. S. Senators (displacing one Democrat) and a full Congressional delegation of five, displacing one Democrat. There had been a vigorous contest in Maine by both parties, and the Republicans were greatly encouraged by the result in the hope that "as goes Maine so goes the Union." But they were doomed to disappointment, and Woodrow Wilson was reëlected President on Nov. 7.

THE ELECTIONS

Significance of the Election Results.—A study of the table on page 170 giving the official figures of the electoral and popular votes for the several Presidential candidates will reveal the essential features of the result of the election. A few incidental, as well as the more significant, aspects of the election may here be pointed out.

The election resulted in the closest contest in the Electoral College since 1876. In 1884 the result hung on a close vote and belated official count in New York, when it was learned three days after the election that Cleveland had carried that state and thereby gained the election by a meagre plurality of about 1,100 out of more than a million votes. In 1916 the final result hung on California, which it was finally found that the Wilson electors had carried by pluralities varying from 1,200 to 3,800 in a total vote of over 900,000. The meagre pluralities in other states show the closeness of the popular vote, as in New Hampshire, Minnesota, West Virginia, Indiana, Maine and Massachusetts.

For the first time within nearly 50 years (1868) a President has been elected without the electoral vote of New York.[1] The election results have become uncertain in more states, and New York and Indiana have ceased to be "pivotal states."

President Wilson is the first Democratic President to be elected to succeed himself since Jackson's election in 1832, 84 years ago. Mr. Wilson received the largest popular vote ever cast for a President 9,128,837, being 2,073,249 more votes than ever previously received by a Democratic candidate. Part of this is accounted for by the increased number of women voters and the growth of the population. In 1912 the total vote was 15,031,000; in 1916 it was 18,534,000.

For this reason the result of the election may be looked upon as a Wilson victory and a personal vindication of the President. The large vote for the President was Wilsonian rather than Democratic, just as in 1904 Mr.

[1] New York's vote against Hayes in 1876 may be excepted, since the decision that year was made by a special commission and not by the vote of the Electoral College.

Roosevelt's notable and triumphant majorities over Judge Parker represented a Rooseveltian vote rather than a Republican vote. In the voting Mr. Wilson proved to be very much stronger than his party. This is clearly seen in the majorities given for Wilson in states that are normally Republican or Progressive, and which while choosing Wilson electors chose Republican governors or U. S. Senators. One need not cite the Progressive states of the West (California, Kansas, Washington, Idaho, Wisconsin, and Minnesota), where the disparity was tremendous between the Republican majority for governor and U. S. Senator and the vote for Wilson for the Presidency; but the same thing is seen, though in less degree, in typical states like Maine and Indiana. The Republicans carried these two states by about 14,000 on their state ticket, but carried them for Hughes by only about 6,000. President Wilson carried the 2nd Congressional District of Indiana by 1,800 majority, but the Democratic candidate for Congress (Mr. Cullop) lost the District to his Republican opponent by 1,000 majority, a difference of nearly 3,000 votes. This is typical of many districts in many parts of the country and may explain why with Wilson's reëlection the Democrats practically lost the House of Representatives.

Mr. Wilson is no longer a minority President. In 1912 there was a popular majority against him (combining the vote of the field in opposition) of 2,459,000. He was in a minority of 1,323,728 as against Roosevelt and Taft. In 1916 he received 2,842,623 more votes than in 1912, and 1,518,895 more than the combined Roosevelt-Taft vote of that year. In 1916 he lacked a popular majority by only 275,913. He carried a large majority of the states, out of the 48. While Hughes as a rule carried the more populous states, the population of the states voting for Wilson was about the same as those voting for Hughes, about 45,000,000.

The election returns and a struggle within the Republican National Committee following the election, do not show that the Republican-Progressive breach is by any means healed. Party harmony, which was the purpose of Mr. Hughes' candidacy, has not been realized. The divisions and differences within the Republican party remain and have been to some extent accentuated. Of the more than 4,000,000 Progressives who voted for Mr. Roosevelt in 1912, half of them had gone back into the Republican party in 1914. Of the 2,000,000 that remained it appears that from one-third to one-half voted for President Wilson in preference to Mr. Hughes in 1916, especially in the West. Perhaps a million of Progressive Republicans who broke away in 1912 have found in President Wilson a Progressive leader more to their mind than was the candidate of the "reunited party" of 1916. The Progressives of Kansas, Washington, California, Idaho and Nebraska have again defeated the Republican party because of their feeling that the machinery and the party nominations were under the influence and control of the wrong men. The Progressive character of these states and their distrust of Hughes and his party are seen by the great disparity between the Hughes vote and the heavy majorities for the Progressive Republican candidates in these states: 116,000 for Senator La Follette in Wisconsin, which Hughes carried by only 28,000, nearly 300,000 for Senator Johnson in California, and 67,000 for Senator Poindexter in Washington, and over 162,000 for Governor Capper in Kansas, all three of these States being carried by Wilson; and over 67,000 for Senator-elect Kellogg in Minnesota, and 153,000 for the Republican governor, while Hughes carried Minnesota by the narrow margin of 392. The women who helped to turn the election in some of these states to Mr. Wilson were largely progressive and independent in their politics. They were not influenced chiefly by the pacific slogan "He kept us out of war," but rather because they approved the legislative record of the Administration—workmen's compensation, child-labor laws, and other humanitarian legislation, which appealed to them as progressive.

The election returns have suggested a reconstruction of American political geography. Observers of the po-

litical map conclude that the sceptre of power has passed to the West in conjunction with the South. It is said that a new sectionalism has appeared. The South, the West, the Pacific-Coast states and Ohio constitute a new and significant sectional combination against the East and North. There is no such sectional division. The map may make an appearance of a division on sectional lines, but a study of the popular vote will show that this sectionalism is entirely in the seeming. This is seen in the meagre Republican pluralities in the Northeast. Wilson carried New Hampshire. Indiana was carried by Hughes by less than 9,000 in a vote of nearly 700,000. There was a "stand-off" in Minnesota, and a large Wilson plurality in Ohio (89,000) and Wilson narrowly escaped defeat by the close vote in California. There was no sectionalism in the popular vote outside of the South. It was the candidates and the issues, not sectional interest, that determined the voting. Relatively few changes in the popular voting would have given quite a different color to the map.

California, Governor Johnson and the Defeat of Hughes.—California, as the decisive "pivotal" state, and its governor, Hiram Johnson, have come into notable prominence in connection with the election results. The outstanding fact in the California result was that while Hughes lost the state to Wilson by a plurality of about 3,800, Governor Johnson, running on the Republican ticket for U. S. Senator, carried the state by nearly 300,000 over his Democratic competitor. In view of this fact, Governor Johnson was accused of disloyalty to Mr. Hughes and of being responsible for the loss of California to his party and for the consequent defeat of the national Republican cause. But the only blame attaching to Governor Johnson seems to have been in his inability to control the vote of his Progressive followers on the Presidency and to undo the harm that had been done by stupid and bungling management in California by the Republican reactionaries of the "Old Guard" before Johnson and his friends obtained complete control of the Republican organization of the state.

When the Chicago conventions adjourned, Johnson united with Roosevelt (though with more heaviness of heart at the abandonment of the Progressive party) in the support of Hughes and the Republican party. He returned to California from the Progressive Convention with the purpose of aiding in carrying his state for Hughes. He became a candidate in the Republican primaries for the U. S. Senatorship and was engaged in the contest against the "stand-pat" opposition when Hughes came to California on his campaign tour. In answer to the charge of disloyalty brought against him after the election, Governor Johnson asserted that a few petty politicians in California had so misused Mr. Hughes and his visit to that state that the injury could not be undone. This small coterie had created a situation in which it was made to appear that Mr. Hughes was entirely reactionary and that he was not sympathetic with California's progressive achievements of the past six years. Mr. Hughes was not allowed to meet Governor Johnson nor to have anything to do with the Progressives of California. The politicians who were allowed to guide Mr. Hughes during his visit to that state not only affronted Progressives and ignored Progressive leaders, but they ignored a state and its record of progressive humanitarian legislation. "Californians," said Governor Johnson,

> saw the men who would return them to the disgraceful condition from which after tremendous struggle and sacrifice, they had finally emerged, surrounding with an impassable cordon the Presidential candidate and openly proclaiming that none should be permitted near who believed in the newly won political freedom. . . . A quarter of a century of infamous corporation rule, which could not be broken because of the old political convention system, and six years of triumph and accomplishment under a direct primary had given our people a full and penetrating knowledge of the two systems, and no matter what may be their political affiliations, they will never return to the old reactionary corporation government of which they rid themselves in 1910. When Hughes came to California our people saw first with amazement, then with sadness, then with increasing indignation, that apparently he was wholly in charge of those who represented the old system.

Mr. Hughes seemed unable to break

away from these reactionary influences or to express independently whatever progressive convictions he may have entertained, and it was not until after Governor Johnson had carried the Republican as well as the Progressive primaries in California that Hughes recognized the California leader in a telegram of congratulation. It seemed like a belated recognition and it appeared to be forced by circumstances beyond Mr. Hughes' control. After that it was not easy to bring the California Progressives into line for Hughes. This incident had weight also in Kansas, Washington, Minnesota, and among Progressives in other parts of the country and the impression was created that the Republican party managers had no intention of yielding any real concessions to Progressive purposes in return for their votes.

For a decade the progressive voters of California of both parties had been fighting bi-partisan forces of corruption and corporation rule and had finally succeeded in banishing them from power. Now these forces were seeking to use the reabsorption of the Progressives by the Republicans as an opportunity to bring themselves back into power, to retire the Progressive leader of the state, and to discredit the whole progressive movement. Into this state under these conditions Hughes came in his campaign without a word of recognition of Johnson or a sign of sympathy for the fight for good government which had been made under Johnson's leadership. He appeared with, travelled with, and stood with, the "regulars" of the old kind, and, so far as Hughes seemed to know, California Progressivism had no existence. It appeared that his six years on the bench had made him oblivious of a decade of political progress in the West. This is sufficient to explain why Hughes lost California, Washington, Kansas and the election.

The Women's Vote.—The effect of the women's vote became a subject of controversy. In Illinois, where their votes were received separately from those of men (since women could not vote on offices created by the state constitution), the women appear to have voted about as the men did, their votes making no appreciable difference in the result. In California, Idaho, Washington, Kansas and Montana the women were especially active, and in most of these states they have been considered responsible for the defeat of the Republican candidate for President. In Montana a young woman was elected to Congress, Miss Jeannette Rankin. Miss Rankin was elected on the Republican ticket, though Wilson carried Montana by 34,000 majority. She will be the first woman ever to sit in the American Congress. She has been an ardent worker for woman's suffrage on the farms and in the mines of her State and she is credited with having been more than any other woman the means of obtaining the suffrage for women in Montana.

The "Woman's party" sought to control, or influence, the two national conventions in favor of woman's suffrage by the prospect of "four million votes of women." They presumed to hold these votes as a menace over the heads of party managers. Both party platforms declared in favor of votes for women but by state action rather than by the Susan B. Anthony Federal amendment. The "Woman's party," however, obtained from Mr. Hughes an expression in favor of the Federal amendment. In consideration of this declaration the "Woman's party" sent a special train through the "suffrage states" of the West with women speakers advocating Hughes' election. This train was satirized as the "Wall Street Special" or "The Golden Special" in view of its being financed by wealthy men or women in the East. It was charged that it had an influence contrary to its design. It aroused antagonism and the reports were quite general that it tended to increase the Wilson vote among the Western women. (See also II, *Popular Government and Current Politics.*)

William J. Bryan and the Elections.—The year showed that William J. Bryan is still a potent factor in American politics. Mr. Bryan spoke in 20 states during the campaign; 17 of these were carried by Mr. Wilson. The East paid no attention to Mr. Bryan's campaigning, but large and enthusiastic crowds greeted him in the trans-Mississippi states, to which,

for the most part, he confined his efforts. Instead of proving lukewarm or indifferent to President Wilson's reëlection, as it was hoped by the Republicans he might do on account of his pacifist views and his resignation from the Wilson Cabinet, Mr. Bryan ardently supported the Administration. On the Democratic slogan, "He has kept us out of war," his peace pleas were effective with the rank and file of all parties in the West, especially among the farmers and the women voters. Following the election Mr. Bryan announced to the national convention of the W. C. T. U. that he is "still in politics with both feet," but he has left the discussion of purely economic and political questions for moral ones. He accepts prohibition and woman suffrage as the great moral issues of this generation, and he says the Democratic party is the party to lead the fight in the nation. A rising tide of prohibition or anti-saloon sentiment as shown in the elections seems to support Mr. Bryan's contention (see II, *Popular Government;* and XV, *The Liquor Problem*). At a conference of "dry" Democrats of Indiana, at Indianapolis, ten days after the election (Nov. 17), Mr. Bryan announced his belief that prohibition would be a paramount issue in 1920 and he urged vigorous action to prevent the Democratic party from coming under the control of the liquor interests.

Senate and House.—The Democrats will control the next Senate by a majority of 12 as against a majority of 16 in the present Congress. Senator Kern, of Indiana, the Democratic floor leader in the Senate, was defeated for reëlection, as was Senator Taggart from that state, who had been serving *ad interim* by appointment. Senator Lippitt of Rhode Island was defeated by his Democrat opponent, and Senator Martine of New Jersey by his Republican opponent, Frelinghuysen.

In the House the two parties have the same number of Representatives. The ability of the Democrats to elect a speaker and organize the House will depend upon their winning the support of the former Progressives and of a few members of minor parties and men of independent dispositions. (For complete lists of members-elect of the Sixty-fifth Congress see V, *The National Administration.*)

Minor Parties.—The Socialist party lost nearly 300,000 votes, receiving about 590,000 as against 897,000 in 1912, a larger popular vote than had ever before been cast for a Presidential candidate of the Socialist party (see also XV, *Socialism*). The party reëlected a member of Congress, and increased its representation in state legislatures.

The Prohibition party vote was not largely increased. Hanly and Landrith, the party ticket, received 221,000 of the popular vote, which is a gain of 12,000 over that of 1912. While the party Prohibitionists were not supported in the popular voting, the cause of prohibition was greatly advanced in the referendum voting on liquor laws and prohibition amendments (see XV, *The Liquor Problem*).

Campaign Contributions.—On Nov. 26 the treasurer of the Democratic National Committee (Wilbur W. Marsh) made public the official statement of campaign contributions and disbursements which he is required to file under the New York law. The total amount contributed to the Democratic fund was $1,584,548. Of this $465,556 was received in amounts of less than $100. Contributions of $100 and over amounted to $1,079,319. There was a deficit of something over $300,000 due to expenditures made in branch headquarters. This statement filed at Albany under the New York law does not include either the receipts or disbursements of the Chicago headquarters, which brought the total receipts up to $1,808,348 and the total disbursements to $1,684,589, with bills amounting to $196,000 still outstanding. More than 170,000 individuals contributed to the fund. Mr. Marsh said the Presidential canvass came nearer being financed by popular contributions than any in the history of American politics. Texas led in the number of contributors; New York state in the amount contributed.

The report of the treasurer of the Republican National Committee (Cornelius N. Bliss) filed with the Clerk of the House of Representatives, showed total contributions of $2,445,421 from 34,205 contributors, and ex-

penditures of $2,441,565, leaving a surplus of $3,856.

In addition to these funds handled and accounted for by the national committees there were state, county and local funds which amounted to many thousands more. The New York state committees received, for example, for the Democrats $206,629, and for the Republicans $432,027.

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II. POPULAR GOVERNMENT AND CURRENT POLITICS

ARTHUR N. HOLCOMBE

Progress of Popular Government.—The record of progress in popular government during 1916 is brief. Woman suffrage was voted on by the people in three states, Iowa, South Dakota and West Virginia, and rejected in all. The total number of equal-suffrage states, including Illinois, remains 12. The initiative and referendum were voted on by the people of but one state, Minnesota; although the amendment received a majority of 136,000 of those voting on the question, it was lost under the constitutional requirement of a majority of those voting at the election. The total number of direct-legislation states, therefore, exclusive of the two states, Maryland and New Mexico, which possess the popular referendum but not the initiative, is still 18. The recall was not acted on by the people of any state. Neither the state-wide direct primary nor the Presidential-preference primary made any further progress. The few remaining states in which the state-wide direct primary has not yet been established either by law or by party rule for the most part held no legislative sessions in 1916 and do not possess the direct popular initiative; hence there was no opportunity in such states for the adoption of primary laws. The lack of a contest for the Presidential nomination of the Democratic party and the refusal of the two principal candidates for the Republican nomination to engage in an active primary campaign caused a suspension of public interest in the further extension of the Presidential primary system (see also I, *Politics and Parties*). The Democratic primaries were perfunctory in character, and the contestants in the Republican primaries were for the most part restricted to "favorite sons" and other local candidates. The results of the Presidential primaries were consequently of little interest to the people generally. The system cannot be said to have had a fair trial in 1916. Proposals to hold constitutional conventions were voted on in six states, Colorado, Massachusetts, New Hampshire, New York, South Dakota and Tennessee; the proposals were adopted in Massachusetts and New Hampshire and rejected by the other four states. The present status of popular government is indicated in the table on the next page. (See also VI, *Amendments to State Constitutions.*)

The outlook for 1917 is more promising. The legislatures of most of the states will be in session and a constitutional convention will be held in one. The work of the constitutional convention in Massachusetts should be particularly interesting. The radical reformers in that state will attempt to secure the adoption of various progressive reforms, notably the initiative and referendum, and the conservative reformers will doubtless attempt to secure the adoption of some plan of legislative and administrative reorganization along the lines indicated by the work of the New York convention of 1915 (*A. Y. B.*, 1915, pp. 87-94).

Progressive Legislation.—During the year there have been sessions of the legislature in only 16 states. In 11 of these there were regular sessions, and in five there were special sessions. The legislatures which met in regular session were those of eastern and southern states, where there was little demand for progressive legislation. The legislatures which met in special

STATUS OF POPULAR GOVERNMENT

State[1]	Woman Suffrage	Initiative and Referendum[3]	Recall[5]	Direct Primary[8]	Presidential Preference Primary
New England					
Me.	....	1908[3]	....	1911	....
N. H.	....	....	....	1909	1913
Vt.	....	....	....	1915	1915
Mass.	....	....	....	1911	1912
R. I.	....	....	....	....	....
Conn.	....	....	....	....	....
Middle Atlantic					
N. Y.	**1917**[9]	....	....	1913	1913
N. J.	....	....	....	1911	1911
Pa.	....	....	....	1913	1913
East-North-Central					
Ohio	....	1912	....	1908	1913
Ind.	....	....	....	1915	1915
Ill.	1913[2]	....	....	1910	1912
Mich.	....	1913	1913[5]	1909	1912
Wis.	....	....	....	1903	1911
West-North-Central					
Minn.	....	*1916*	....	1912	1913
Iowa	*1916*	....	....	1907	1913
Mo.	....	1908	....	1907	....
N. D.	....	1914	....	1907	1911
S. D.	*1916*	1898[3]	....	1907	1912
Neb.	....	1912	....	1907	1911
Kan.	1912	....	1914[6]	1908	....
South Atlantic					
Del.	....	....	....	....	....
Md.	....	1915[4]	....	1910	1912
Va.	....	....	....	1912	....
W. Va.	*1916*	....	....	1915	....
N. C.	....	....	....	....	1915
S. C.	....	....	....	P.R.[8]	....
Ga.	....	....	....	P.R.[8]	....
Fla.	....	....	....	1913	....
East-South-Central					
Ky.	....	....	....	1912	....
Tenn.	....	....	....	1909	....
Ala.	....	....	....	P.R.[8]	....
Miss.	....	....	....	1912	....
West-South-Central					
Ark.	**1918**[9]	1910	....	P.R.[8]	....
La.	....	....	1914[5]	1912	....
Okla.	....	1907	....	1908	....
Tex.	....	....	....	P.R.[8]	....
Mountain					
Mont.	1914	1906[3]	....	1912	1912
Idaho	1896	1912[3]	1912[5]	1909	....
Wy.	1869	.....	....	1911	....
Col.	1893	1910	1912[7]	1910	....
N. M.	....	1911[4]	....	....	....
Ariz.	1912	1911	1911[5]-12	1909–12	....
Utah.	1896	1900[3]	....	....	....
Nev.	1914	1904[4]-12	1912	1909	....
Pacific					
Wash.	1910	1912[3]	1912[6]	1907	....
Ore.	1912	1902	1908	1904	1910
Cal.	1911	1911	1911	1909	1911
Total.	12	20	10	42	21

NOTE.—Dates in **boldface** are those of proposed submission to the people; the date *1916* in *italics* denotes rejection by the people during the year.

[1] States are arranged by geographical divisions according to the classification of the U. S. census. [2] Women may vote for presidential electors and local officers, and for state officers if the office is created by statute. [3] In six of the 21 states possessing the initiative and referendum, the initiative applies to statutes but not to constitutional amendments, viz., Maine, South Dakota, Montana, Idaho, Utah, and Washington. [4] The referendum only. [5] In four of the ten states possessing the recall, it does not apply to judges, viz., Michigan, Louisiana, Idaho, and Washington. [6] The recall applies also to appointive officers. [7] The recall applies also to judicial decisions. [8] In those states indicated by P.R. the direct primary is conducted under the rules of the Democratic party, but is not established for all parties by statute. [9] Submission to people already once authorized by legislature but contingent upon favorable action by legislature of 1917.

session, though meeting mostly in the West where the interest in progressive legislation has been greatest, were called to deal with particular emergencies. Consequently few measures relating to the popularization of government were enacted.

State-wide registration laws were adopted in Louisiana and Oklahoma. New Jersey adopted a law providing for personal registration in cities with more than 10,000 inhabitants and authorizing registration by affidavit on the part of persons prevented from registering in person by illness or absence from the state. Absent voters were authorized to vote by registered mail in Virginia, and in any precinct within the state in Oklahoma. A general primary and corrupt-practices law was adopted in Louisiana, and minor changes in Presidential-preference primary laws were made in Massachusetts and South Dakota. Massachusetts also repealed that part of the primary law of 1914 which provided that the voters of all parties should make their nominations at a joint primary upon a single ballot without revealing their party affiliation, and restored a system of party enrolment. Under the new law, which was submitted to the voters in November for their approval and accepted by them, separate ballots will be provided for each party, and the voter will be required to make his choice between the parties in public and thereafter to affiliate with the same party unless he files notice of a purpose to change his party affiliation. Such changes do not become effective until after 30 days. Hence it will no longer be possible for voters of one party to vote

in the primary of another. Maryland likewise adopted an act to prevent voters from voting at primary elections without disclosing their party affiliations. In California, on the other hand, the legislature has sought to relax, rather than to stiffen, the test of party affiliation. In that state the legislature of 1915 adopted an act providing for non-partisan nominations and elections of state officers. This act was referred to the voters by petition and rejected by them. In 1916 the legislature, under the leadership of the Johnson administration, again tried to eliminate national party divisions from state politics by abolishing the official party enrolment and providing that voters should declare their party affiliation each year at the time of the primary. This act also was brought before the people by means of the referendum and rejected by them.

The Massachusetts Constitutional Convention.—The most important measures of the year in the eastern states were the Massachusetts and New Hampshire acts providing for constitutional conventions. These acts were submitted to the voters in November and accepted by them (see VI, *Amendments to State Constitutions*). Under the terms of the Massachusetts act 320 delegates will be elected by the people in May, 1917, and will meet in June to revise the present constitution. Sixteen of the delegates are to be chosen in the state at large, 64 by congressional districts, four from each district, and the remaining 240 by legislative districts, like the members of the lower branch of the state legislature. By this arrangement it is expected that the interests of the state as a whole will be duly represented and that local interests will be less likely to predominate than in legislative bodies chosen entirely by local districts. Nominations are to be made by petition, and in any district where there are three times as many candidates as places to be filled, a non-partisan primary will be held. All delegates will be elected on a non-partisan ballot. The work of this convention bids fair to be the most important event of 1917 in the field of state government.

DIRECT LEGISLATION

Volume of Initiated Legislation.—The record of legislation for 1916 in the states which possess the direct popular initiative is more interesting than that of the states in which there were legislative sessions. In the 18 states in which provision for the initiation and adoption of measures by the people without the intervention of the legislature existed at the beginning of the year, there were in all some 48 measures submitted to the people by that procedure. The average number of measures per state proposed for adoption was less than in 1912 or in 1914, and in no state were there as many measures on the ballot as in several states in recent years. In Arizona there were 10 measures submitted under the initiative; in Oregon, eight; in Colorado, six; and in California, four. In several of the direct-legislation states there were no initiated measures.

Liquor Laws.—The principal topic of legislation in these states was the liquor question. Altogether a dozen or more measures of this character were proposed by the initiative. The temperance forces and the liquor interests were responsible for about the same number of measures. In each of Arizona, California, Oregon, Washington and Michigan there were two liquor measures submitted to the people, and in Colorado, Missouri and Nebraska, one each. In four of these states the temperance forces initiated state-wide prohibitory laws, and in one state, California, they also initiated a less stringent measure as an alternative. The latter, if adopted, was to take effect in 1918, the former, in 1920. In two states, Arizona and Oregon, the temperance forces initiated measures designed, in conformity with the Webb-Kenyon Act of Congress (*A. Y. B.*, 1913, pp. 3, 400), to prevent the importation of liquor from without the state, thus strengthening the prohibitory laws adopted in 1914. The liquor interests on the other hand initiated a number of measures designed to dimin-

ish the scope of existing prohibitory laws. In Arizona, they proposed a local-option law. In Oregon and Colorado they proposed measures licensing the manufacture and sale of malt liquors containing not more than four per cent. of alcohol, to be delivered to the consumer at his residence in the original package. In Washington they proposed two separate measures, known as the hotelmen's liquor measure and the breweries measure, respectively. The latter resembled the Oregon and Colorado measures. The hotelmen's measure was one professedly designed to permit the sale of liquor in hotels but not in saloons. In general the liquor interests were unsuccessful at the polls. (See also VI, *Amendments to State Constitutions;* and XV, *The Liquor Problem.*)

Reform of State Government.—The principal subject of proposed legislation in the direct-legislation states next to the regulation of the liquor traffic was the reform of state government. In Arizona two measures of this character were initiated. One of these was designed to increase the size of the lower house of the legislature and make it more popular in character. This was to be accomplished by abolishing the system of apportionment of members by counties and election on general ticket in the counties at large, and substituting a system of election in small single-member representative districts. Thus every 1,500 voters were to be entitled to a separate representative. The other measure, proposed by the State Federation of Labor, provided for the abolition of the state Senate. In Colorado also two measures of this character were initiated. One was designed to perfect the civil-service law which had been seriously injured by unfriendly legislation adopted by the legislature of 1915. The other was designed to merge the state Tax Commission with the state Board of Equalization. In California a measure was proposed to prevent the governor from appointing members of the legislature to office before the expiry of their terms, and in Oklahoma two measures relating to elections were initiated by the Socialists. One was designed to alter the method of registering the voters; the other, to give the Socialists separate representation on all election boards. In South Dakota, the Richards direct-primary law was brought before the people again. This unique measure was originally initiated and adopted by the people in 1912 (*A. Y. B.*, 1912, p. 60). In 1913 the legislature provided for submitting to the people in the following year a substitute measure of the usual type, which was rejected (*A. Y. B.*, 1913, p. 74). In 1915, therefore, the legislature repealed the Richards law of 1912, despite the popular rejection of the substitute measure the previous year, and enacted another measure of the usual type (*A. Y. B.*, 1915, p. 86). The friends of the Richards primary law thereupon reinitiated their own measure, and it was rejected by only 323 majority. In Arkansas a measure was initiated to perfect the existing procedure for direct legislation. The most important of these measures was probably the Arizona project for the abolition of the Senate. (See also VI, *Amendments to State Constitutions.*)

Other Measures.—The rest of the measures proposed for adoption directly by the people in 1916 related to a wide variety of subjects. There were two single-tax measures, one in California and one in Oregon. Several measures were proposed providing for the location of state institutions. Rural-credits acts or measures providing for the lending of moneys in state school funds upon the security of unincumbered improved farm lands were proposed in several states. The abolition of capital punishment was again proposed in Arizona, and a workman's-compensation law was proposed by the State Federation of Labor in the same state. Other proposed legislation related to the guarantee of bank deposits, the incorporation of fraternal societies, the care of the insane, the conduct of prize fights, Sunday closing, anti-compulsory vaccination, divorce, the preservation of game, and verdicts by a four-fifths majority of the jury in civil actions. These measures for the most part raised simple, straightforward issues with respect to matters coming within the experience of the mass of the voters, upon which

they were presumably capable of acting confidently and intelligently. As the people of the direct-legislation states become more accustomed to the initiative, there seems to be a tendency to use it more deliberately. The average number of initiated measures per state is less than at first, and the number of extremely radical measures also seems to be less. (See also VI, *Amendments to State Constitutions.*)

WOMAN SUFFRAGE

Party Action.—The woman suffragists were more active in 1916 than ever before, and in some ways more successful. Though they captured no new states, they did capture both the major political parties. For the first time the Republicans and the Democrats endorsed woman suffrage in their national platforms. The Republican platform, adopted at Chicago on June 8, declared that "the Republican party, reaffirming its faith in government of the people, by the people, and for the people, as a measure of justice to one-half the adult people of this country, favors the extension of the suffrage to women, but recognizes the right of each state to settle this question for itself." The Democratic platform, adopted at St. Louis on June 16, declared that "we recommend the extension of the franchise to the women of the country by the states upon the same terms as to men." Thus all parties were at last on record in favor of woman suffrage. The Republican plank was adopted by the convention without dissent; the Democratic, after a heated debate, by a vote of 888½ to 181½. Both parties took the same position with respect to the manner in which women should obtain the franchise. Each declared that it should be obtained by state, not by Federal, action. Hence, it fell to the lot of the party organizations in the several states to execute the policy favored or recommended by the respective national conventions. Between the date of the national conventions and the date of the general election in November, Republican state conventions in at least a dozen states (outside of the equal-suffrage states) either specifically declared for suffrage or endorsed the national platform of the party with its suffrage plank, and Democratic state conventions did the same in at least as many states.

Agitation for a Federal Amendment.—But this action was not wholly satisfactory to most woman suffragists. The difficulties in the way of obtaining the vote for all women on the same terms as men by means of amendments to the state constitutions are practically insuperable. In some states the constitutional limitations upon the submission of proposed amendments to the people are such that it is extremely difficult to secure the submission of amendments, even when they are not highly controversial, like woman suffrage. Among these states, for example, are Indiana and Illinois. In other states the requirement of special majorities for the adoption of constitutional amendments by the people, sometimes three-fifths or even two-thirds of all the votes cast, again a majority of all who attend the polls, whether they vote on the proposed amendment or not, makes the winning of the franchise for all women by that process very unpromising. Accordingly, now that enough states have been won for equal suffrage to give the women numerous friends in both houses of Congress, suffragists incline more and more towards Federal action as a means of settling the question.

Two principal modes of Federal action have been proposed. One is to adopt an amendment to the Federal Constitution, the so-called "states'-rights amendment," providing that a woman-suffrage amendment might be submitted to the people of any state upon petition by eight per cent. of the voters thereof without the intervention of the legislature and adopted by a majority of those voting thereon. This amendment, if adopted, would have simplified the procedure for the adoption of woman suffrage in most states, but would have left each state to decide the question for itself. The other proposed mode of Federal action is to

adopt a constitutional amendment providing that "the right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any state, on account of sex." This, the so-called Susan B. Anthony amendment, when ratified by the legislatures of three-fourths of the states, would automatically secure the franchise for women in all the states on the same terms as men. The states'-rights amendment was proposed by the National American Woman Suffrage Association in 1914 in order to conciliate the opposition to Federal action on the part of the supporters of the existing right of the states to control the franchise, particularly that of the Senators and Representatives from the South (*A. Y. B.*, 1914, p. 60). At the close of 1915, however, the measure was abandoned without having been brought to a vote in either branch of Congress. The efforts of the suffragists working for Federal action were concentrated upon the Susan B. Anthony amendment to the Federal Constitution, the ultimate goal of the suffragists since it was first proposed in 1869.

Suffrage Organizations and Tactics.—There are two principal suffrage organizations maintaining lobbies at Washington to work for Federal action, the National American Woman Suffrage Association and the Congressional Union. The former was organized in 1890 by consolidating two older associations, founded shortly after the Civil War. It is a federation of state suffrage associations, with which certain other suffrage societies are affiliated, such as the National College Equal Suffrage League. At the forty-eighth annual convention, held in Atlantic City, Sept. 4-10, 1916, there were 544 delegates present, representing 41 states and several affiliated societies. Prior to 1916 the National American Woman Suffrage Association had paid more attention to state than to Federal action, and had been studiously non-partisan in its methods. Through its Congressional committee, however, it had maintained a lobby at Washington since 1913. The other principal suffrage organization at Washington is the Congressional Union. This organization was created in 1913 by suffragists who believed that the time had come to concentrate upon the adoption of the Susan B. Anthony amendment, and to abandon the policy of non-partisanship for one of active hostility to whichever party might be in power, until it should consent to submit this amendment to the states. The Republican and Democratic suffrage planks of 1916, therefore, although gratefully accepted by the National American Woman Suffrage Association for what they were worth, were wholly unsatisfactory to the Congressional Union. While the Republican Convention was in session at Chicago, the Congressional Union launched the National Woman's Party, an organization of woman voters in the equal-suffrage states, for the purpose of turning those states against the Presidential and Congressional candidates of whichever party should prove to be the less friendly to woman suffrage. The new party held its first convention on Aug. 10-12 at Colorado Springs. Since each of the major parties was equally unfriendly to the Susan B. Anthony amendment, in accordance with the avowed policy of the Union, the party resolved to oppose the candidates of the party in power, the Democrats. Meanwhile, on Aug. 1, Mr. Hughes had declared that he personally favored the submission of the Susan B. Anthony amendment by Congress to the states and the speedy settlement of the woman-suffrage question once for all. Mr. Wilson, however, still adhered to his opinion that the question should be settled by each state separately for itself. The Woman's Party did not specifically endorse Mr. Hughes for the Presidency, but it commended his attitude towards the Federal amendment.

The National American Woman Suffrage Association held its annual convention at Atlantic City on Sept. 6-10. Attempts to commit the Association to an endorsement of the Republican candidate for the Presidency were defeated and its non-partisan policy was reaffirmed. It was further resolved to work for suffrage, as before, both by state and Federal action, but the purpose was clearly revealed

to lay the principal stress upon the work for the Federal amendment. To this end provision was made for more centralized control of the work of the separate state associations by the national officers, and the Congressional committee was instructed to concentrate all its resources upon a determined attempt to carry the Susan B. Anthony amendment through the last session of the Sixty-fourth Congress.

Results of Elections.—Despite the endorsement of woman suffrage by all political parties and by all candidates for the Presidency, the suffragists failed both to carry any of the states in which state equal-suffrage amendments were put to a popular vote and to secure favorable action in either branch of Congress upon the proposed Federal amendment. In Iowa equal suffrage was defeated on June 5 by a vote of 162,683 to 173,024. It was defeated on Nov. 7 in South Dakota and West Virginia (see VI, *Amendments to State Constitutions*). In the United States Senate the proposed amendment was reported favorably by the Committee on Woman Suffrage, but no vote was taken by the Senate itself. In the House of Representatives the proposed amendment was pigeon-holed in the Judiciary Committee and all efforts to get it reported to the House were fruitless until December. At the general election on Nov. 7, Mr. Wilson carried every equal-suffrage state except Illinois and Oregon. There is no evidence that the open hostility of the Congressional Union and the National Woman's Party to the Democratic candidates in these states was much, if any, more damaging at the polls than the non-partisanship of the National American Woman Suffrage Association.

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III. INTERNATIONAL RELATIONS

CHARLES H. ALBRECHT

INTERNATIONAL RELATIONS OF THE UNITED STATES

I. WITH EUROPEAN BELLIGERENT COUNTRIES

SUBMARINES AND ARMED MERCHANTMEN

The Case of the "Persia."—The sinking of the Peninsular and Oriental liner *Persia* off the coast of Crete on Dec. 30, 1915, with a loss of over 200 lives, among them the American Consul at Aden (*A. Y. B.*, 1915, p. 58), seemed likely again to bring to a crisis the submarine controversy with the Teutonic empires which the concessions of the Austro-Hungarian Government in the case of the *Ancona* (*A. Y. B.*, 1915, pp. 54-8) had for the moment resolved. On Jan. 7, however, the German Ambassador handed the following memorandum to the Secretary of State:

(1) German submarines in the Mediterranean had, from the beginning, orders to conduct cruiser warfare against enemy merchant vessels only in accordance with general principles of international law, and in particular measures of reprisal, as applied in the war zone around the British Isles, were to be excluded.

(2) German submarines are therefore permitted to destroy merchant vessels in the Mediterranean, i.e. passenger as well as freight ships as far as they do not try to escape or offer resistance, only after passengers and crews have been accorded safety.

(3) All cases of destruction of enemy merchant ships in the Mediterranean in which German submarines are concerned are made the subject of official investigation, and, besides, subject to regular prize court proceedings. In so far as American interests are concerned, the German Government will communicate the result to the American Government. Thus also in the *Persia* case, if the circumstances should call for it.

(4) If commanders of German submarines should not have obeyed the orders given to them, they will be punished; furthermore, the German Government will make reparation for damage caused by death of or injuries to American citizens.

Later Germany denied that any of her submarines had been responsible for the sinking of the *Persia*, and similar denials came also from Austria-Hungary and Turkey. No submarine had been seen by any of the survivors of the *Persia*, and in the absence of any tangible evidence to fix the responsibility, the matter was allowed to rest by the United States Government after the receipt of these denials.

The Case of the "William P. Frye."—In addition to the German memorandum of Jan. 7, another source of reassurance was the publication on Jan. 8 of the note of the German Government of Nov. 29, 1915, arranging for the assessment of indemnity and arbitration of disputed points of law and treaty interpretation in the case of the *William P. Frye* (*A. Y. B.*, 1915, p. 37), particularly in view of the following paragraph:

Until the decision of the permanent court of arbitration, the German naval forces will sink only such American vessels as are loaded with absolute contraband, when the pre-conditions provided by the Declaration of London are present. In this the German Government quite shares the view of the American Government that all possible care must be taken for the security of the crew and passengers of a vessel to be sunk. Consequently, the persons found on board of a vessel may not be ordered into her lifeboats except when the general conditions, that is to say, the weather, the condition of the sea, and the neighborhood of the coasts afford absolute certainty that the boats will reach the nearest port.

The "Lusitania" Negotiations.—On Jan. 10 it was announced that the German Ambassador, Count von Bernstorff, who had been working with Secretary Lansing for the settlement of the *Lusitania* question, had for-

warded a tentative agreement to the German Foreign Office for approval. The draft as approved by the Foreign Office and as submitted by the German Ambassador, although it offered indemnity for the loss of life, did not disavow the sinking of the *Lusitania* or admit its illegality. It was, therefore, rejected by the American Government, which made it clear that the mere offer of indemnity as an act of grace without a declaration of legal liability therefor was unsatisfactory (Jan. 25). As a result of the publication of a reported statement by Dr. Zimmermann of the German Foreign Office that the settlement of the submarine question had been prevented by "new demands" of the American Government, Secretary Lansing stated that no new demands had been made, but that the following essentials had been insisted upon throughout:

(1) A disavowal of the sinking of the *Lusitania* or an admission that it was illegal and that Germany is liable for the killing of neutrals.
(2) Payment of indemnity and the making of reparation for the loss of American lives and property.
(3) Guarantees that no more attacks of the kind shall be made.

The Secretary added that it was about the first requirement that the present controversy revolved, the other two requirements having been met by the German Government. The German position was said to be that while Germany could disavow the act of the commander of a submarine who violated, disregarded or failed to receive instructions (as in the *Arabic* case), no Government could disavow an act committed in accordance with its instructions and for which it was responsible.

On Feb. 9 press reports stated that a new draft submitted by the German Government had been found acceptable, except that the American Government had requested Germany to alter the wording so as to state that she "recognizes" instead of "assumes" liability for the disaster. According to later press reports, this change in the wording was agreed to by the German Government within a week, but the Department of State has not published the note of the German Government, and on Oct. 18 Mr. Polk, then Acting Secretary of State, stated that the note had never been accepted. It is not impossible that the notes of the German and Austro-Hungarian Governments of Feb. 10, announcing that armed merchantmen would be treated as war vessels after Feb. 29, played a large part in holding up the settlement of the *Lusitania* question, which was still unresolved at the close of the year.

Armed Merchantmen.—On January 18 Secretary Lansing addressed informal and confidential notes to the diplomatic representatives of the Allied powers in Washington urging in the interests of humanity the abandonment of the practice of arming merchant vessels provided the Teutonic powers would agree "to adhere strictly to the rules of international law in the matter of stopping and searching merchant vessels, determining their belligerent nationality, and removing the crews and passengers to places of safety before sinking the vessels as prizes of war."

The following quotation from the notes indicates the line of reasoning that led to this proposal:

I do not feel that a belligerent should be deprived of the proper use of submarines in the interruption of enemy commerce since those instruments of war have proven their effectiveness in this particular branch of warfare in the high seas. . . .

This right [of merchant ships to carry defensive armament] seems to have been predicated on the superior defensive strength of ships of war, and the limitation of armament to have been dependent on the fact that it could not be used effectively in offense against enemy naval vessels, while it could defend the merchantmen against the generally inferior armament of piratical ships and privateers.

The use of the submarine, however, has changed these relations. Comparison of the defensive strength of a cruiser and a submarine shows that the latter, relying for protection on its power to submerge, is almost defenseless in point of construction. Even a merchant ship carrying a small caliber gun would be able to use it effectively for offense against a submarine. Moreover, pirates and sea rovers have been swept from the main trade channels of the seas, and privateering has been abolished. Consequently, the placing of guns on merchantmen at the present day of submarine warfare can be explained only on the ground of a purpose to render merchantmen superior in force to submarines and to prevent warning and visit and search by them. Any armament, therefore, on a merchant vessel would seem to have the character of an offensive armament.

If a submarine is required to stop and search a merchant vessel on the high seas and, in case it is found that she is of enemy character and that conditions necessitate her destruction, to remove to a place of safety all persons on board, it would not seem just or reasonable that the submarine should be compelled, while complying with these requirements, to expose itself to almost certain destruction by the guns on board the merchant vessel.

The Secretary referred to the right to arm as "a doubtful legal right which may be denied on account of new conditions," and concluded:

I may add that my Government is impressed with the reasonableness of the argument that a merchant vessel carrying an armament of any sort, in view of the character of submarine warfare and the defensive weakness of undersea craft, should be held to be an auxiliary cruiser and so treated by a neutral as well as by a belligerent Government, and is seriously considering instructing its officials accordingly.

On Feb. 10 the German and Austro-Hungarian Governments notified the United States of their intention to treat armed merchantmen as war vessels after Feb. 29. The *note verbale* of the German Foreign Office stated that the "German Government has no doubt that a merchantman assumes a warlike character by armament with guns, regardless of whether the guns are intended for defense or attack." The note was accompanied by a number of exhibits, including photographic reproductions of "confidential" instructions to British armed merchantmen stated to have been found on captured vessels, and the following quotations from these "confidential" instructions were especially emphasized:

It is not advisable to open fire at a range greater than 800 yards unless the enemy has already opened fire. . . .

If a submarine is obviously pursuing a ship by day and it is evident to the master that she has hostile intentions, the ship pursued should open fire in self-defense, notwithstanding the submarine may not have committed a definite hostile act such as firing a gun or torpedo.

A long list of cases in which Allied merchant vessels were claimed to have fired on enemy submarines was also annexed, as proof of the statement in the note that "from reports of the German naval forces numerous cases became known in which English merchantmen not only offered armed resistance to the German war vessels, but proceeded to attack them on their own initiative, and in so doing they frequently even made use of false flags."

After this note had been published and the contents of the informal notes of Secretary Lansing to the diplomatic representatives of the Allied Governments became known, considerable sentiment developed in Congress in favor of warning Americans not to travel on armed merchantmen of the belligerent powers. Resolutions to this end were introduced in both houses. Administration leaders endeavored to prevent action on these resolutions in order to leave President Wilson a free hand in dealing with the issue, but the President insisted that they be brought to a vote to prove that Congress was behind him. Congress declined to meet the question squarely, but the result of the votes was interpreted as an endorsement of the Administration. (See also I, *The Sixty-fourth Congress.*)

Meanwhile, discussions had been going on between Secretary Lansing and Ambassador von Bernstorff as to the scope of previous assurances in the light of the German note of Feb. 10. The German Ambassador is reported to have called attention to the assurances of the British Ambassador of Aug. 25, 1915, that British armed merchant vessels "are merely peaceful traders armed only for defense, that they will never fire unless first fired upon, and that they will never under any circumstances attack any vessel," as inconsistent with the evidence of the German Government. On Feb. 29 the German Ambassador addressed a note to the Secretary of State in which he quoted from an article, dated Feb. 26, in the semi-official *North German Gazette*, containing the following paragraph:

If President Wilson in his letter to Senator Stone says that announced measures against enemy merchant ships are contrary to express assurances given by Germany and Austria-Hungary, this is apparently caused by misunderstanding. For these assurances referred only to peaceful liners and not to such ships whose armament is connected with aggressive purposes.

On the same day is was reported that assurances had been given that "no enemy merchantman is to be tor-

pedoed without warning unless the presence of armament on board of such vessel is proved." How the presence of the armament was to be proved was not stated, but reports intimated that the use of the armament in resistance might be the proof required.

On March 23 the diplomatic representatives of the Allies at Washington communicated identic memoranda from their Governments declining to accept the proposal contained in Mr. Lansing's note of Jan. 18. The memoranda set forth the unwillingness of the Allies to abandon "their acknowledged right" to arm and "to agree that upon a non-guaranteed German promise, human life may be surrendered defenseless to the mercy of an enemy who, in circumstances of this kind as in many others, has shown himself to be both faithless and lawless." The memorandum concluded:

At the end of his letter, the Honorable Secretary of State hypothetically considered the possibility of eventual decisions under which armed merchant vessels might be treated as auxiliary cruisers.

It is His Britannic Majesty's Government's conviction that the realization of such a hypothesis which would materially modify, to Germany's advantage, the statement of views published in this respect by the American Government on September 19, 1914, can not be given practical consideration by the American authorities.

Such a modification would be inconsistent with the general principles of neutrality as sanctioned in paragraphs 5 and 6 of the preamble to the 13th convention of The Hague concerning maritime neutrality. Moreover the result would be contrary to the stipulations of the 7th convention of The Hague, the transformation of merchant vessels into war ships. Finally, if armed merchant vessels were to be treated as auxiliary cruisers, they would possess the right of making prizes, and this would mean the revival of privateering.

Secretary Lansing, on April 7, addressed an informal note to the representatives of the Entente powers regretting that these powers were unable to "see their way to accede to the proposal" and accepting "their decision as final."

On March 25 the Department of State issued a memorandum on the status of armed merchant vessels, in which it considered such vessels in neutral ports and upon the high seas. The conclusions arrived at were summarized as follows:

The *status* of an armed merchant vessel as a warship in neutral waters may be determined, in the absence of documentary proof or conclusive evidence of previous aggressive conduct, by presumption derived from all the circumstances of the case.

The *status* of such vessel as a warship on the high seas must be determined only upon conclusive evidence of aggressive purpose, in the absence of which it is to be presumed that the vessel has a private and peaceable character, and it should be so treated by an enemy warship.

As to the method of determining the status of such a vessel in a neutral port the Department stated:

There is no settled rule of international law as to the sufficiency of evidence to establish such a presumption. As a result a neutral Government must decide for itself the sufficiency of the evidence which it requires to determine the character of the vessel.

Evidently the Department intended to continue the procedure already in force in cases in which armed vessels entered our ports, of obtaining assurances through diplomatic channels that the guns of the vessel would be used only for defensive purposes before allowing it clearance. As to the determination of status by a belligerent encountering an armed vessel on the high seas the Department laid down the basis:

On the other hand, to safeguard himself from possible liability for unwarranted destruction of life and property the belligerent should, in the absence of conclusive evidence, act on the presumption that an armed merchantman is of peaceful character.

A presumption based solely on the presence of an armament on a merchant vessel of an enemy is not a sufficient reason for a belligerent to declare it to be a warship and proceed to attack it without regard to the rights of the persons on board. Conclusive evidence of a purpose to use the armament for aggression is essential.

The following further rules were laid down with reference to the status of such vessels encountered on the high seas:

If, however, before a summons to surrender is given, a merchantman of belligerent nationality, aware of the approach of an enemy warship, uses its armament to keep the enemy at a distance, or after it has been summoned to surrender it resists or flees, the warship may properly exercise force to compel surrender.

If the merchantman finally surrenders, the belligerent warship may release it or take it into custody. In the case of an enemy merchantman it may be sunk,

but only if it is impossible to take it into port, and provided always that the persons on board are put in a place of safety. In the case of a neutral merchantman, the right to sink it in any circumstances is doubtful.

A merchantman entitled to exercise the right of self-protection may do so when certain of attack by an enemy warship, otherwise the exercise of the right would be so restricted as to render it ineffectual. There is a distinct difference, however, between the exercise of the right of self-protection and the act of cruising the seas in an armed vessel for the purpose of attacking enemy naval vessels.

In the event that merchant ships of belligerent nationality are armed and under commission or orders to attack in all circumstances certain classes of enemy naval vessels for the purpose of destroying them, and are entitled to receive prize money for such service from their Government, are liable to a penalty for failure to obey the orders given, such merchant ships lose their *status* as peaceable merchant ships and are to a limited extent incorporated in the naval forces of their Government, even though it is not their sole occupation to conduct hostile operations.

The Sinking of the "Sussex."—The French channel steamer *Sussex*, regularly employed in carrying passengers between Folkestone and Dieppe, a route apparently not used for transporting troops, was sunk in the English Channel by an external explosion at 2:50 p. m. on March 24. She had on board 325 or more passengers and a crew of 53 men. The vessel was not armed and it was established that it never had been armed or used for carrying troops, and that no explosives were on board. No submarine was seen, but the captain, the first officer, the boatswain and some other persons, including several of the 25 or more American citizens who were passengers on the vessel, testified that they saw clearly the wake of a torpedo just before the explosion. About 80 of the passengers, including citizens of the United States, were killed or injured as a result of the explosion.

The Department of State on March 27 instructed the American Ambassador at Berlin to inquire immediately of the German Government whether a submarine belonging to Germany or her allies was responsible for the disaster, adding that a prompt reply was expected. On April 10 the German Foreign Office informed Ambassador Gerard that at 3:55 p. m. (Central European time) on March 24 a German submarine, while still submerged, torpedoed without warning a vessel which the commander of the submarine stated he believed to be an English war vessel. The reasons for this belief were given in the note. As a result of the torpedo a severe explosion of the foreship took place. A reproduction of a sketch of the vessel made by the commander of the submarine was attached, and as it differed with reference to the position of the funnels and the shape of the stern from the *Sussex*, the German Government concluded that the vessel could not have been the *Sussex*. It was pointed out that this was the only case of attack by a submarine at the time and in the locality of the disaster in question. The note concluded:

> Should the American Government have at its disposal further material for forming judgment on the case of the *Sussex* the German Government begs to request that this material may be communicated to it in order that it may be able to subject this material to an examination also. In the event of differences of opinion arising between the two Governments in this connection, the German Government declares at this time its readiness to permit the facts to be ascertained by a mixed committee of investigation, pursuant to the third title of The Hague Convention of October 18, 1907, for the pacific settlement of international disputes.

On April 18 the American Government replied, stating its firm conviction that a German submarine was the cause of the disaster. It was pointed out that all the circumstances of the case mentioned in the German note corresponded exactly with the case of the *Sussex* except the difference between the sketch, drawn from memory by the German commander, and the *Sussex*. The note gave the conclusions of the American naval and military attachés at Paris that the explosion could not have been of an internal character, that the depth of the water eliminated the possibility of an explosion caused by a fixed mine, and that an examination of the fragments of steel left in the ship indicated that they were not from a mine or from a torpedo such as were used by the Allied Governments, but did by actual comparison correspond with the torpedoes used by Germany. The note then went into the whole submarine

situation, placing the issue before the German Government in a manner clearly indicated in the following paragraphs:

If the sinking of the *Sussex* had been an isolated case the Government of the United States might find it possible to hope that the officer who was responsible for that act had wilfully violated his orders or had been criminally negligent in taking none of the precautions they prescribed, and that the ends of justice might be satisfied by imposing upon him an adequate punishment, coupled with a formal disavowal of the act and payment of a suitable indemnity by the Imperial Government. But, though the attack upon the *Sussex* was manifestly indefensible and caused a loss of life so tragical as to make it stand forth as one of the most terrible examples of the inhumanity of submarine warfare as the commanders of German vessels are conducting it, it unhappily does not stand alone.

On the contrary, the Government of the United States is forced by recent events to conclude that it is only one instance, even though one of the most extreme and most distressing instances, of the deliberate method and spirit of indiscriminate destruction of merchant vessels of all sorts, nationalities, and destinations, which have become more and more unmistakable as the activity of German undersea vessels of war has in recent months been quickened and extended. . . .

The Government of the United States has been very patient. . . . It has made every allowance for unprecedented conditions and has been willing to wait until facts became unmistakable and were susceptible of only one interpretation.

It now owes it to a just regard for its own rights to say to the Imperial Government that that time has come. It has become painfully evident to it that the position which it took at the very outset is inevitable, namely, the use of submarines for the destruction of an enemy's commerce, is, of necessity, because of the very character of the vessels employed and the very methods of attack which their employment of course involves, utterly incompatible with the principles of humanity, the long-established and incontrovertible rights of neutrals, and the sacred immunities of noncombatants.

"Unless the Imperial Government," the note concluded,

should now immediately declare and effect an abandonment of its present methods of submarine warfare against passenger and freight-carrying vessels, the Government of the United States can have no choice but to sever diplomatic relations with the German Empire altogether. This action the Government of the United States contemplates with the greatest reluctance but feels constrained to take in behalf of humanity and the rights of neutral nations.

On the following day (April 19) the President appeared before both Houses of Congress in joint session, and, after reviewing the situation, clearly indicated the gravity of the crisis (see also I, *The Administration*).

The reply to the American note was handed to Ambassador Gerard on May 4. Meanwhile, the American Ambassador had been in conference with Chancellor von Bethmann-Hollweg, and both the Chancellor and the American Ambassador had gone to the front for conferences with the Kaiser. In its reply the German Government admitted the possibility that the vessel referred to in its previous note was in fact identical with the *Sussex*, and added:

The German Government begs to reserve further communications on the matter until certain points are ascertained which are of decisive importance for establishing the facts of the case. Should it turn out that the commander was wrong in assuming the vessel to be a man-of-war the German Government will not fail to draw the consequences resulting therefrom. . . .

The German submarine forces have had, in fact, orders to conduct submarine warfare in accordance with the general principles of visit and search and destruction of merchant vessels as recognized by international law, the sole exception being the conduct of warfare against the enemy trade carried on enemy freight ships that are encountered in the war zone surrounding Great Britain; with regard to these no assurances have ever been given to the Government of the United States.

The note contained also the following definite assurance:

The German Government, guided by this idea, notifies the Government of the United States that the German naval forces have received the following orders: In accordance with the general principles of visit and search and destruction of merchant vessels recognized by international law, such vessels, both within and without the area declared as naval war zone, shall not be sunk without warning and without saving human lives, unless these ships attempt to escape or offer resistance.

A great part of the note was given over to a comparison of the conduct of Great Britain and Germany in the war and this led up to the following conclusion:

But neutrals can not expect that Germany, forced to fight for her existence, shall, for the sake of neutral interest, restrict the use of an active weapon if her enemy is permitted to continue to apply at will methods of warfare violat-

ing the rules of international law. Such a demand would be incompatible with the character of neutrality, and the German Government is convinced that the Government of the United States does not think of making such a demand, knowing that the Government of the United States has repeatedly declared that it is determined to restore the principle of the freedom of the seas, from whatever quarter it is violated.

Accordingly, the German Government is confident that, in consequence of the new orders issued to its naval forces, the Government of the United States will now also consider all impediments removed which may have been in the way of a mutual coöperation towards the restoration of the freedom of the seas during the war as suggested in the note of July 23, 1915, and it does not doubt that the Government of the United States will now demand and insist that the British Government shall forthwith observe the rules of international law universally recognized before the war as they are laid down in the notes presented by the Government of the United States to the British Government on December 24, 1914, and November 5, 1915. Should the steps taken by the Government of the United States not attain the object it desires to have the laws of humanity followed by all belligerent nations, the German Government would then be facing a new situation, in which it must reserve itself complete liberty of decision.

On May 8 Secretary Lansing replied to the note of May 4, accepting the declaration of the German Government but making it clear that this declaration could be in no sense conditional on any action which this Government might take *vis à vis* Great Britain, concluding as follows:

The Government of the United States notifies the Imperial Government that it can not for a moment entertain, much less discuss, a suggestion that respect by German naval authorities for the rights of citizens of the United States upon the high seas should in any way or in the slightest degree be made contingent upon the conduct of any other Government affecting the rights of neutrals and noncombatants. Responsibility in such matters is single, not joint; absolute, not relative.

Case of the "Petrolite."—On Dec. 5, 1915, an Austrian submarine fired upon and injured the American tank steamer *Petrolite*, holding one of the seamen as a hostage on the submarine while the latter forcibly removed supplies, according to an affidavit of the captain of the vessel filed with the Department of State. Ambassador Penfield was instructed to ask for an investigation and explanation of the attack. The Austrian reply stated that the *Petrolite* was fired upon in the belief that she was an enemy vessel flying the American flag as a ruse, that she was about to attempt to ram the submarine, and that the provisions were voluntarily given up by the captain. The rejoinder of the American Government, dated June 21, submitted evidence to refute each of the statements of the Austrian note, and concluded:

In the absence of other and more satisfactory explanation of the attack on the steamer than that contained in the note addressed to you by the Foreign Office, the Government of the United States is compelled to regard the conduct of the commander of the submarine in attacking the *Petrolite* and in coercing the captain as a deliberate insult to the flag of the United States and an invasion of the rights of American citizens for which this Government requests that an apology be made; that the commander of the submarine be punished; and that reparation be made for the injuries sustained by the payment of a suitable indemnity.

The Austro-Hungarian Government asked later for further information. The outcome of the negotiations has not been announced.

Torpedoing of the "Marina," "Arabia" and Other Vessels.—Within a couple of weeks of Oct. 26, when the British steamer *Rowanmore*, on which were two Americans and five Filipinos, was sunk, the steamers *Marina*, *Lanao*, *Arabia* and *Columbian*, on all of which there were Americans, were torpedoed. No Americans, however, lost their lives except in the case of the *Marina*, where six Americans, who were members of the crew, were among the missing. All were freighters except the British P. and O. liner *Arabia*. In the cases of the *Rowanmore*, *Marina* and *Arabia*, it was alleged that no warning had been given. The *Marina*, *Rowanmore* and *Arabia* were of American registry; the *Lanao* was of Philippine registry, although an agreement had been entered into for its sale to a Norwegian firm; the *Columbian* sailed under the American flag. In the case of the *Rowanmore* it was alleged that the survivors were shelled by the submarine after they left the vessel; the *Lanao* and *Columbian*, which carried contraband, were sunk after the crew had been removed.

In each case inquiries were made

through the American Ambassador at Berlin as to the circumstances and responsibility. In the case of the *Lanao* the reply of the German Foreign Office set forth the agreement of sale to the Norwegian firm, and the facts that the vessel carried contraband and that it was sunk after the crew was safely removed from the vessel. In the case of the *Arabia*, sunk on Nov. 6 off the island of Cerigo, the German Government replied on Dec. 14 that the submarine commander had sunk the ship without warning, believing her to be a troop transport from the facts that she was not of the distinctive color of P. and O. liners, was far off the usual route between Port Said and Malta, and had on board many colored persons in native dress. The note concluded:

> Should the American Government give the official data showing that the *Arabia* was at the time of the torpedoing an ordinary passenger steamer, the action of the commander would not have been in accordance with the instructions given him, since these instructions are now, as before, in agreement with the assurances of the German note of May, 1916. This would then be a case of regrettable mistake, from which the German Government would promptly draw the appropriate consequences.

In response to an inquiry the British Government declared that the *Arabia* was not at the time she was sunk, and never had been, in the service of the Government of Great Britain or of her allies; that she carried some government passengers booked as ordinary passengers at the expense of the Government; that there were no Asiatics on board except the native Indian crew; and that vessels do not follow the ordinary route on account of submarines. This information, it is understood, was communicated to the German Foreign Office in the American rejoinder.

In the case of the *Marina* also the German Government made the allegation that the vessel was believed to be a British transport. Inquiries of the British Government brought the information that although the *Marina* was engaged by the British Government to carry horses on its eastbound voyages it was under no engagement for the westbound trip during which it was torpedoed. This information was communicated to the German Government.

No final decision in any of the cases was announced up to the close of the year.

The "Deutschland" and the "U-53."—On July 9 the German merchant submarine *Deutschland* entered the Chesapeake to discharge a cargo of German dyestuffs at Baltimore and to take back a cargo of nickel and rubber to Germany (see also XXI, *Naval Architecture*). She was unarmed and evidently constructed for cargo purposes and not for military operations, and after an examination the Department of State decided that she was entitled to all the privileges of a merchant vessel, rejecting arguments advanced by the Entente powers that a submarine was by nature a war vessel and could not be treated otherwise. On Oct. 7 the *U-53*, a German war submarine, entered the port of Newport, R. I., with a letter for the German Ambassador, and after a stay of a few hours, part of which was occupied by an exchange of visits between the commander and the American naval authorities at the port, departed for the high seas, having taken on board no supplies. Operating off Nantucket lightship, 45 miles from the Island of Nantucket, the nearest American territory, she sank five vessels, including a British passenger steamer bound for Nova Scotia and the Dutch steamship *Bloomersdyk*, loaded with grain consigned to the Dutch Government. The passengers and crew in each case were given time to leave in lifeboats before the ships were sunk and there was no loss of life, American torpedo boats rescuing many of those set adrift. The Government of the United States decided that the submarine had committed no act against which the United States could protest.

The conclusion of the Entente powers, as expressed in their identic memoranda to the Government of the United States, that "any belligerent submarine entering a neutral port should be detained there," and thus "excluded from the rules hitherto recognized by the laws of nations regarding the admission of war or merchant vessels into neutral waters, roadsteads or ports and their sojourn

there," was based on the following conditions which they characterized as "special and novel":

First, by the fact that these vessels can navigate and remain at sea submerged and can thus escape all control and observation; second, by the fact that it is impossible to identify them and establish their national character, whether neutral or belligerent, combatant or non-combatant, and to remove the capacity for harm inherent in the nature of such vessels.

It may be further said that any place which provides a submarine warship far from its base with an opportunity for rest and replenishment of its supplies, hereby furnishes such addition to its powers that the place becomes in fact, through the advantages which it gives, a base of naval operations.

The memoranda concluded:

The allied Governments take this opportunity to point out to the neutral Powers the grave danger incurred by neutral submarines in the navigation of regions frequented by belligerent submarines.

In other words, the Entente was now adopting the same argument that Germany had previously offered in her controversy with the United States, i.e., that since submarines were a new weapon in naval warfare the existing rules of international law were not applicable to them.

In entire conformity with the attitude it had assumed toward the German Government, the American Government in its reply of Aug. 31 indicated plainly that it regarded the existing rules of international law as applicable to submarines, adding that:

The allied Powers have not set forth any circumstances, nor is the Government of the United States at present aware of any circumstances, concerning the use of war or merchant submarines which would render the existing rules of international law inapplicable to them.

"So far as the treatment of either war or merchant submarines in American waters is concerned," the American memorandum continued, "the Government of the United States reserves its liberty of action in all respects and will treat such vessels as, in its opinion, becomes the action of a Power" that has always stood for neutral rights, expressing "surprise that there appears to be an endeavor of the allied Powers to determine the rule of action governing what they regard as a 'novel situation'" by warning neutral powers of dangers incurred by their submarines. To the last paragraph of the Entente memoranda the Government of the United States replied:

That it holds it to be the duty of belligerent Powers to distinguish between submarines of neutral and belligerent nationality, and that responsibility for any conflict that may arise between belligerent warships and neutral submarines on account of the neglect of a belligerent to so distinguish between these classes of submarines must rest entirely on the negligent Power.

The action of the *U-53* in sinking vessels off the coast of the United States was the subject of considerable comment in the British press and in Parliament, where it brought forth, on Oct. 17, a statement from Viscount Grey in reply to a question by Lord Beresford. The Foreign Secretary stated that no official protest with reference to the *U-53* would be made by Great Britain pending the investigation which he assumed was being made by the United States. He referred to the correspondence between the Governments of Great Britain and the United States in which the latter protested against the patrolling of the coast of the United States by British war vessels "as inconsistent with the treatment to be expected of a friendly Power in time of war." The implication of this reference was that, as Great Britain had given orders to its war vessels to stop this practice though maintaining the legality thereof, the operations of the *U-53* off the coast of the United States should not be permitted.

Attitude of Other Neutral Powers.—A different attitude from that taken by the Government of the United States was reflected in a Norwegian ordinance of Oct. 13, 1916, to take effect Oct. 20, forbidding belligerent war submarines from traversing Norwegian waters except in cases of emergency, when they must remain upon the surface and fly their national flag. The ordinance provides that submarines violating the provision will be attacked by armed forces. According to the same ordinance, merchant submarines are only to be allowed in Norwegian waters in full daylight in a surface position and flying their na-

tional colors. The ordinance has been the subject of vigorous protest by Germany as a departure from international law inconsistent with true neutrality.

Holland met the issue at the beginning of the war by a proclamation forbidding belligerent warships from entering Dutch waters or ports except under stress of weather or because of damage suffered at sea, and the Swedish Government by decree of July 19, 1916, instructed Swedish ships to fire upon any belligerent war submarine passing through Swedish waters, although the passage of mercantile submarines through territorial waters was unrestricted.

RESTRAINTS ON NEUTRAL TRADE

Reply to the American Representations of Oct. 21, 1915.—The memorandum enclosed with a note of the British Ambassador of April 24, 1916, in reply to the American Government's representations of Oct. 21, 1915, on British restraints on neutral commerce (*A. Y. B.*, 1915, p. 28), deviated little from the position taken in the previous notes of the British Government. To the American Government's contention that the British order-in-council of March 11, 1915, with reference to the overseas trade in goods of German origin or goods ultimately destined for Germany (*A. Y. B.*, 1915, p. 18) could not be justified under international law since it in effect decreed a blockade of neutral ports; to the contention that there was no warrant in international law for neutral vessels being repeatedly taken into British ports for examination instead of this being done on the high seas; to the contention that the "well established and long settled practice" of prize courts, to consider only the ship's documents and papers, the goods found on board and the written replies under oath of the officers and seamen in the first hearing in the case of vessels detained under suspicion of carrying contraband, had been modified by orders-in-council so as to result in detention on mere suspicion; to the contention that goods intended for the "common stock" of neutral European countries were being interfered with on the ground that they were likely to be reëxported to Germany, the British Government reiterated that conditions in the present war were such that modifications of existing principles of international law and prize court proceedings were necessary, adding that the British Government would "continue their efforts to make the exercise of what they regarded as their belligerent rights as little burdensome to neutrals as possible." No concessions were offered, however, except in the matter of dues and charges upon vessels detained and subsequently released.

Opinions of Sir John Jellicoe and the French Ministry of Marine as to the impracticability of examining large boats under modern conditions in seas subject to submarine activity were quoted. It was argued that in view of the possibility of sending later directions by telegraph the ship's papers often contained little evidence of the destination of goods, and "the practice and procedure adopted in prize courts are not settled or regulated by international law, but they were determined by each nation for itself."

The long list of vessels detained, together with the period of detention, which was annexed to the American note of Oct. 21, 1915 (*A. Y. B.*, 1915, p. 21), was dismissed with the statement that the British Government felt sure that the Government of the United States would agree that there was no need for them to enter into the facts of each particular case, "for the lists comprise only ships dealt with by the British authorities," adding, "perhaps the most striking conclusion which can be drawn from these lists is the rapidity with which the vessels are released and the very small amount of loss and inconvenience to which they are, as a rule, exposed." In this connection it is interesting to learn from the published correspondence in the case of the American steamer *Joseph W. Fordney*, carrying a cargo of cattle fodder consigned to Malmo, Sweden, which was taken into Kirkwall on April 8, 1915, that she was still held for prize-court proceedings on May 9, 1916. In a telegram sent by Secretary Lansing to

Ambassador Page on Nov. 3, 1915, he stated:

> It appears that approximately one-half a year after the goods were seized it is believed by the British authorities that they are in possession of such evidence as alone would have justified the seizure.

The British memorandum gave further statistics showing increases in American exports to Scandinavia and Holland during the first nine months of 1915, without reference, however, to the comment of Secretary Lansing in the American note of Oct. 21, 1915, "that the comparative values fail to take into account the increased price of commodities resulting from a state of war or to make any allowance for the diminution in the volume of trade which the neutral countries in Europe previously had with the nations at war, a diminution which compelled them to buy in other markets." It may be added that the exports to Scandinavia and Holland for the first six months of 1916, in spite of increased prices, decreased by nearly 50 per cent. as compared with 1915.

The system of "letters of assurance" issued by the British Embassy at Washington to cover proposed shipments to Scandinavia was referred to in the memorandum as one of the methods devised by the British Government for lightening the burdens of neutrals. The result of the inauguration of this system has been the refusal of the steamship companies to accept goods for Scandinavia (and latterly Greece) unless accompanied by such a letter of assurance, which is issued by the Embassy only after specific authority in each individual case is obtained from London. No "letters" are issued without strong proof being furnished that the goods will be used only for neutral consumption and in the case of many articles, which are much needed in Germany, no "letters" are issued in any circumstances during considerable periods of time.

Analogy was again drawn in the memorandum between the doctrine of continuous voyage as evolved by the U. S. Supreme Court during the Civil War and the attitude of the British Government with reference to goods shipped to Holland and Scandinavia, and the inference of the words "admittedly retaliatory and therefore illegal" in the American note of Oct. 21, 1915, was denied by the British Government. Finally, the British Government again insisted that British prize courts would apply international law though in conflict with an order-in-council. In connection with this point, interest attaches to the decision of the Judicial Committee of the Privy Council in the case of the *Zamora*, to the effect that the substantive law enforced by the British Prize Court is supplied not by municipal law but by the law of nations as known to the tribunal, at least to the extent that an order-in-council based merely on the royal prerogative cannot overrule or authoritatively interpret international law even on doubtful points. This is probably the first decision squarely to this effect. It must be noted, however, that there is in the decision a clear implication that an act of Parliament or an order-in-council based thereon would amount to a construction of the law of nations which would be binding on any British court.

Pending Cases.—The unofficial arrangement by which American importers submitted to the British Embassy through the foreign-trade adviser of the Department of State proof in cases of goods of German or Austrian origin ordered and paid for prior to March 1, 1915, or ordered prior to March 1, 1915, in circumstances making the American importer liable to pay for the goods whether he received them or not (*A. Y. B.*, 1915, p. 28), resulted in favorable action on the part of the British Foreign Office in the great majority of the cases. In a number of cases, however, the Foreign Trade Adviser's Office and the British authorities differed as to whether proof of payment or liability within the terms of the agreement had been offered. A representative of the Foreign Trade Adviser's Office left for London in June, 1916, to take up directly with the Foreign Office these latter cases, as well as certain cases of cancellation (on the basis of evidence subsequently coming to the knowledge of the British authorities, chiefly through their censorship of the mails) and of lapsing of "permits." A limited time

within which goods covered by "permits" must be moved from Rotterdam was fixed by the British authorities during the spring of 1916. It was often impossible to obtain shipment within the limit, normally two months, due to the German embargoes on the exportation of many commodities, which the German authorities were unwilling to raise until after assurances of safe transit were obtained from Great Britain. The American representative took up a limited number of cases with the Foreign Office, which, however, rendered unfavorable decisions in practically every case.

The "packers" cases (*A. Y. B.*, 1915, p. 27) were settled out of court during the course of the year, the chief cause of delay in these, as in the *Wilhelmina* case (*A. Y. B.*, 1915, p. 13), being difference of opinion as to the price to be paid by the British Government in view of the differences between the prices commanded by the commodities in question in the country of origin, in Great Britain, and in the countries of destination.

Retaliatory Action by Congress.—Both the many prohibitions of the Allies on the importation of goods of various characters into one or other of the Allied countries and the interference in the port of the Allies with the shipment of goods to Germany and Austria and neutral European countries, were aimed at in the following amendment to the General Revenue Act of Sept. 8 giving the President a discretionary power of retaliation:

> Sec. 805. That whenever during the existence of a war in which the United States is not engaged, the President shall be satisfied that there is reasonable ground to believe that under the laws, regulations, or practices of any country, colony, or dependency contrary to the law and practice of nations the importation into their own or any other country, dependency, or colony of any article the product of the soil or industry of the United States and not injurious to health or morals is prevented or restricted, the President is authorized and empowered to prohibit or restrict during the period such prohibition or restriction is in force, the importation into the United States of similar or other articles, products of such country, dependency, or colony as in his opinion the public interest may require; and in such case he shall make proclamation stating the article or articles which are prohibited from importation into the United States; . . . The President may change, modify, revoke, or renew such proclamation in his discretion.

Penalties of fine and imprisonment are provided for the breach of such proclamation. (See also I, *The Sixty-fourth Congress.*)

Contraband.—In its protests to the British Government in regard to restraints on neutral trade, the American Government reserved for future discussion or protest questions relating to the inclusion in the British contraband lists of any articles to which it might take objection. The comprehensiveness of the contraband lists was constantly increased and with it the marked tendency toward minimizing the distinction between absolute and conditional contraband. An order-in-council of March 30 applied the doctrine of continuous voyage to conditional as well as absolute contraband, another definite departure from the Declaration of London. It was decreed that "the fact that the carriage of the goods shall entail trans-shipment or subsequent transport by land" shall not interfere with the right to capture the goods, and "enemy destination is presumed to exist if the goods are consigned to a person who, during the present hostilities, has forwarded imported contraband goods to territories belonging to or occupied by the enemy." The burden to prove innocent destination was put upon the owner of the goods.

On April 15 the British Foreign Office issued a White Paper stating that "the circumstances of the present war are so peculiar that His Majesty's Government consider that for practical purposes the distinction between the two classes of contraband has ceased to have any value." The reason for this marked departure was stated as follows:

> So large a proportion of the inhabitants of the enemy country are taking part, directly or indirectly, in the war that no real distinction can now be drawn between the armed forces and the civilian population. Similarly, the enemy Government has taken control, by a series of decrees and orders, of practically all the articles in the list of conditional contraband, so that they are now available for Government use. So long as these exceptional conditions continue our belligerent rights with respect to the two kinds of contraband are the

same and our treatment of them must be identical.

On July 7, by another order-in-council, the last vestiges of the Declaration of London, which had been modified by many previous orders-in-council almost out of recognition, were finally abandoned. At the beginning of the war Great Britain had given only a qualified adhesion to the Declaration of London (*A. Y. B.*, 1915, p. 2), and modifications had frequently been made, so that the order of July 7 represented little change from the practice previously enforced. It provided that: (1) the hostile destination required for the condemnation of contraband articles shall be presumed to exist until the contrary is shown if the goods are consigned to or for a person in territory belonging to or occupied by the enemy; (2) the principle of continuous voyage or ultimate destination shall be applicable in cases both of contraband and of blockade; (3) a neutral vessel falsely indicating a neutral destination for the carriage of contraband "shall be liable to capture and condemnation if she is encountered before the end of her next voyage"; and (4) "a vessel carrying contraband shall be liable to capture and condemnation if the contraband, reckoned either by value, weight, volume or freight, forms more than one-half the cargo." The fourth provision, being favorable to belligerent rights, was retained from the Declaration of London.

"Trading with the Enemy."—An Act of the British Parliament approved Dec. 23. 1915, provided for the extension of existing prohibitions upon British firms against trading with the enemy to include in the prohibited categories "persons to whom, by reason of their enemy nationality or enemy associations, though not resident or carrying on business in enemy territory, it appears to the King to be expedient to extend such restrictions." By this Act any person or firm wherever resident could be brought within the terms of the Trading with the Enemy Acts by the simple publication of the name of the person or firm by an order-in-council.

On Jan. 25 Secretary Lansing telegraphed the American Ambassador at London to inform the British Foreign Office that "the Department has reached the conclusion that this Act is pregnant with possibilities of undue interference with American trade, if in fact such interference is not now being practiced." The telegram continued:

> As it is an opinion generally held in this country, in which this Government shares, that the Act has been framed without a proper regard for the right of persons domiciled in the United States, whether they be American citizens or subjects of countries at war with Great Britain, to carry on trade with persons in belligerent countries, and that the exercise of this right may be subject to denial or abridgement in the course of the enforcement of the act, the Government of the United States is constrained to express to His Majesty's Government the grave apprehensions which are entertained on this subject by this Government, by the Congress, and by traders domiciled in the United States. It is, therefore, necessary to bring these views to the attention of Sir Edward Grey and to present to him a formal reservation, on the part of this Government, of the right to protest against the application of this act, in so far as it affects the trade of the United States, and to contest the legality or rightfulness of imposing restrictions upon the freedom of American trade in this manner.

In the reply of the British Government of Feb. 16 the purpose of the legislation was explained as follows:

> The act was framed with the object of bringing British trading with the enemy regulations into greater harmony with those adopted by the French Government since the commencement of the war by applying in some degree the test of nationality in the determination of enemy character in addition to the old test of domicile, which experience has shown can not provide a sufficient basis under modern commercial conditions for measures intended to deprive the enemy of all assistance, direct or indirect, from national resources.
>
> His Majesty's Government realised, however, that the application of this principle to its fullest extent, while entirely legitimate and in accordance with the practice of other countries, might, if applied at the present time to commercial activities as widespread as those of British subjects, involve avoidable inconvenience and loss to innocent traders.
>
> They were careful, therefore, in devising the necessary legislation not only to avoid any definition which would impose enemy status upon all persons of enemy nationality and associations, but also to take powers of discrimination which would enable them to apply the purely commercial restrictions contemplated only in regard to those persons from whom it was necessary in

British interests to withhold the facilities afforded by British resources.

His Majesty's Government have therefore abstained from a course of action admittedly within their rights as belligerents, which is not only the existing practice of the French Government but in strict accordance with the doctrine openly avowed by many other States to be the basis upon which their trading with the enemy regulations would be founded in the event of war, and have confined themselves to passing a piece of purely domestic legislation empowering them to restrict the activities and trade of persons under British jurisdiction in such a manner and to such an extent as may seem to them to be necessary in the national interest. . . .

His Majesty's Government readily admit the right of persons of any nationality resident in the United States to engage in legitimate commercial transactions with any other persons. They can not admit, however, that this right can in any way limit the right of other Governments to restrict the commercial activities of their nationals in any manner which may seem desirable to them by the imposition of prohibitions and penalties which are operative solely upon persons under their jurisdiction.

The note ended with an assurance that the right claimed by Great Britain would be exercised "with every possible care to avoid injury to neutral commerce."

The "Blacklist."—Under the powers granted by the Act of Dec. 23, 1915, statutory lists of persons in nearly all neutral countries with whom British subjects were directed not to trade were published by the British Government. The first "blacklist" of American firms was published on July 18. Eighty-five firms and persons established in this country were included in the list, and a statutory list identical with the British blacklist was also published by the French Government. Some days later a New York newspaper published a list of about a dozen other firms which were stated to be on a supplementary blacklist. It has been noted that practically all the firms on the supplemental list, which, it is understood, was subsequently admitted to be a "confidential" list, were interested in tungsten, a commodity needed by all the belligerents in connection with the manufacture of munitions of war and for other purposes.

On July 26 Acting Secretary of State Polk telegraphed Ambassador Page to inform Sir Edward Grey that the announcement of the blacklisting of firms established in this country had

been received with the most painful surprise by the people and Government of the United States, and seems to the Government of the United States to embody a policy of arbitrary interference with neutral trade against which it is its duty to protest in the most decided terms.

The "extraordinary" scope and effect of the British policy was described in the following terms:

British steamship companies will not accept cargoes from the proscribed firms or persons or transport their goods to any port, and steamship lines under neutral ownership understand that if they accept freight from them they are likely to be denied coal at British ports and excluded from other privileges which they have usually enjoyed, and may themselves be put upon the blacklist. Neutral bankers refuse loans to those on the list and neutral merchants decline to contract for their goods, fearing a like proscription. It appears that British officials regard the prohibitions of the blacklist as applicable to domestic commercial transactions in foreign countries as well as in Great Britain and her dependencies, for Americans doing business in foreign countries have been put on notice that their dealings with blacklisted firms are to be regarded as subject to veto by the British Government. By the same principle Americans in the United States might be made subject to similar punitive action if they were found dealing with any of their own countrymen whose names had thus been listed. . . .

Upon the list of those proscribed and in effect shut out from the general commerce of the world may be found American concerns which are engaged in large commercial operations as importers of foreign products and materials and as distributors of American products and manufactures to foreign countries and which constitute important channels through which American trade reaches the outside world. Their foreign affiliations may have been fostered for many years, and when once broken can not easily or promptly be reëstablished. . . .

Whatever may be said with regard to the legality, in view of international obligations, of the act of Parliament upon which the practice of the blacklist is now employed by His Majesty's Government is understood to be based, the Government of the United States is constrained to regard that practice as inconsistent with that true justice, sincere amity, and impartial fairness which should characterize the dealings of friendly Governments with one another. The spirit of reciprocal trade between the United States and Great Britain, the privilege long accorded to the nationals of each to come and go with their ships and cargoes, to use each the other's shipping, and be served each by the other's merchants is very seriously impaired by arbitrary and sweeping

practices such as this. There is no purpose or inclination on the part of the Government of the United States to shield American citizens or business houses in any way from the legitimate consequences of unneutral acts or practices; it is quite willing that they should suffer the appropriate penalties which international law and the usage of nations have sanctioned; but His Britannic Majesty's Government can not expect the Government of the United States to consent to see its citizens put upon an *ex parte* blacklist without calling the attention of His Majesty's Government, in the gravest terms, to the many serious consequences to neutral right and neutral relations which such an act must necessarily involve. It hopes and believes that His Majesty's Government, in its natural absorption in a single pressing object of policy, has acted without a full realization of the many undesired and undesirable results that might ensue.

In a public statement made shortly after the publication of the blacklist, the British Ambassador declared that there was no idea of blacklisting a firm merely because it continued to do business with a firm that was blacklisted, but if a neutral firm habitually and systematically acted as a cover for the blacklisted firm and so caused direct trading between British firms and blacklisted firms, the case would be different.

As a result of informal representations made through the Department of State to the British Embassy at Washington or by the American Ambassador at London to the Foreign Office the names of seven firms established in the United States which had been blacklisted were removed from the statutory list up to the end of the year.

Lists of "blacklisted" vessels, including American vessels, with which British subjects were forbidden to do business and to which British bunker coal was denied, have also been published by the British authorities from time to time. The control by the British of most of the principal coaling stations of the world and the fact that German bunker coal was placed on the British contraband list make the prohibition of British bunker coal a serious matter.

In retaliation for the British blacklist policy, Congress incorporated in the General Revenue Act of Sept. 8 a section which provides (see also I, *The Sixty-fourth Congress*):

That whenever, during the existence of a war in which the United States is not engaged, the President shall be satisfied that there is reasonable ground to believe that under the law, regulations, or practices of any belligerent country or Government American ships or American citizens are not accorded any of the facilities of commerce which the vessels or citizens of that belligerent country enjoy in the United States or its possessions, or are not accorded by such belligerent equal privileges or facilities of trade with vessels or citizens of any nationality other than that of such belligerent, the President is hereby authorized and empowered to withhold clearance from one or more vessels of such belligerent country until such belligerent shall restore to such American vessels and American citizens reciprocal liberty of commerce and equal facilities of trade; or the President may direct that similar privileges and facilities, if any, enjoyed by vessels or citizens of such belligerent in the United States or its possessions be refused to vessels or citizens of such belligerent; and in such case he may make proclamation of his direction, stating the facilities and privileges which shall be refused, and the belligerent to whose vessels or citizens they are to be refused, and thereafter the furnishing of such prohibited privileges and facilities to any vessel or citizens of the belligerent named in such proclamation shall be unlawful.

Heavy penalties are provided and the President is

authorized and empowered to employ such part of the land or naval forces of the United States as shall be necessary to carry out the purposes of this Act.

The British Government, replying under date of Oct. 10 to the American note of July 26 in regard to the publication of the blacklist of firms in the United States, again maintained that the legislation in question was of a purely municipal character and that the right of the British Government to prohibit British firms to deal with such firms as the Government of Great Britain might see fit was indisputable. Considerable space was devoted to an attempt to prove that the measure was justified by military necessity. As a reason for the abandonment by Great Britain of the Anglo-American practice of treating domicile as the test of enemy character, in favor of "the continental practice, which has always regarded nationality as the test," the development of "means of transport and communication" greatly adding to the capabilities of enemy subjects resident

in foreign countries to render aid to their native land, was cited.

It is common knowledge that German business establishments in foreign countries have been not merely centres of German trade, but active agents for the dissemination of German political and social influence, and for the purpose of espionage. In some cases they have even been used as bases of supply for German cruisers, and in other cases as organisers and paymasters of miscreants employed to destroy by foul means factories engaged in making, or ships engaged in carrying, supplies required by the Allies. Such operations have been carried out in the territory even of the United States itself, and I am bound to observe, what I do not think will be denied, that no adequate action has yet been taken by the Government of the United States to suppress breaches of neutrality of this particularly criminal kind, which I know that they are the first to discountenance and deplore.

The note assured the Government of the United States that the measures in question were not intended to forward British "trade interests at the expense of neutral commerce under the cloak of belligerency," and concluded with a hope "that the explanations contained in their note will destroy such suspicions and correct the erroneous views which prevail in the United States on the subject."

The Economic Conference of the Entente Allies.—In accordance with a decision reached at a Conference of the Entente Powers at Paris on March 28, the representatives of the Governments of Great Britain, France, Belgium, Italy, Japan, Russia, Portugal and Serbia met in Paris on June 14 and drew up a series of resolutions, which they recommended to their Governments, looking to common economic action during and after the war. The resolutions were grouped under three heads:

(1) Measures for the War Period.
(2) Transitory Measures for the Period of the Commercial, Industrial, Agricultural and Maritime Reconstruction of the Allied Countries.
(3) Permanent Measures of Mutual Assistance and Collaboration Among the Allies.

The resolutions under the first head provided for common action among the Allies with reference to trading with enemy firms, wherever resident, and "companies whose business is controlled wholly or partially by enemy subjects or subject to enemy influence, whose names will be included in a special list," the prohibition of importation of enemy goods, or exportation of goods to the enemy even through neutral countries, cancellation of contracts with enemy subjects, and sequestration and control of enemy business undertakings. These measures were already largely in force as far as the principal Allied countries were concerned. It is to be noted, however, that Japan has never promulgated any "blacklisting" measures.

Under the second head the resolutions provide for common action "as a prior claim" for "the reëstablishment of the countries suffering from acts of destruction, spoliation and unjust requisition" (such as Belgium, Serbia and northern France); denial of most-favored-nation treatment to the enemy, special treatment of enemy goods and ships, and prevention of enemy subjects exercising in the territory of the Allies certain industries and professions for a period of years after the war, to be mutually agreed upon; and the conservation of resources of each of the Allied countries for the primary benefit of their Allies.

Under the third heading the Allies register their decision to take such measures as may be necessary "to render themselves independent of enemy countries in so far as regards raw materials and manufactured articles essential to the normal development of their economic activities," to improve land and sea transportation, postal and telegraph facilities between the Allies so as to aid the interchange of commodities, and to unify, as far as possible, patent, indications of origin, and trade-mark laws.

Particularly in Great Britain the resolutions have been the subject of much comment, especially those looking toward tariff discrimination in favor of the Allies and against the Central Powers after the war, with the necessary abandonment of free trade involved therein. Criticism in the American press that this economic conflict after the war is fraught with large possibilities of injury to neutrals has been replied to in several statements by the British Government leaders to the effect that

there is no intention to injure neutrals, from whom the Allied Governments will be as anxious to obtain supplies as they have been during the war. (See also IV, *The British Empire.*)

INTERFERENCE WITH MAILS

Status of Parcel-Post Packages.—In December, 1915, the British Government began the practice of removing parcel post and other mail for examination from vessels plying between Scandinavian and Dutch ports and the United States. In a telegram to the American Ambassador at London dated Jan. 4, 1916, Secretary Lansing stated that while the Department of State was "inclined to regard parcel-post articles as subject to same treatment as articles sent as express or freight in respect to belligerent search, seizure and condemnation," it "can not admit the right of British authorities to seize neutral vessels plying directly between American and neutral European ports without touching at British ports, to bring them into port, and, while there, to remove or censor mails carried by them." The Secretary's telegram continued:

> Modern practice generally recognizes that mails are not to be censored, confiscated, or destroyed on high seas, even when carried by belligerent mail ships. To attain same end by bringing such mail ships within British jurisdiction for purposes of search and then subjecting them to local regulations allowing censorship of mails can not be justified on the ground of national jurisdiction. In cases where neutral mail ships merely touch at British ports, the Department believes that British authorities have no international right to remove the sealed mails or to censor them on board ship. Mails on such ships never rightfully come into the custody of the British mail service, and that service is entirely without responsibility for their transit or safety. . . . Moreover, the detention of diplomatic and consular mail is an aggravating circumstance in a practice which is generally regarded in this country as vexatiously inquisitorial and without compensating military advantage to Great Britain. Please lay this matter immediately before the British Government in a formal and vigorous protest and press for a discontinuance of these unwarranted interferences with inviolable mails. Impress upon Sir Edward Grey the necessity for prompt action in this matter.

On April 3 the French and British Ambassadors laid before the Secretary of State a memorandum, dated Feb. 15, communicated in substance to the American Ambassadors at Paris and London on Feb. 28, setting forth the position of the Allied Governments. The memorandum, which devoted itself primarily to the status of parcel-post packages, which the Department of State admitted in its telegram of Jan. 4 were probably "subject to the same treatment as articles sent as express or freight," concluded with the following announcements:

> 1. That from the standpoint of their right of visitation and eventual arrest and seizure, merchandise shipped in post parcels needs not and shall not be treated otherwise than merchandise shipped in any other manner.
> 2. That the inviolability of postal correspondence stipulated by the Eleventh Convention of The Hague of 1907 does not in any way affect the right of the allied Governments to visit and, if occasion arise, arrest and seize merchandise hidden in the wrappers, envelopes, or letters contained in the mail bags.
> 3. That true to their engagements and respectful of genuine "correspondence," the allied Governments will continue, for the present, to refrain on the high seas from seizing and confiscating such correspondence, letters or despatches, and will insure their speediest possible transmission as soon as the sincerity of their character shall have been ascertained.

The American Protest.—On May 24 the Secretary of State forwarded vigorous notes in identical terms to the British and French Ambassadors. The following quotations from these notes clearly set forth the American case:

> While the Government of the United States agrees that "genuine correspondence" mail is inviolable, it does not admit that belligerents may search other private sea-borne mails for any other purpose than to discover whether they contain articles of enemy ownership carried on belligerent vessels or articles of contraband transmitted under sealed cover as letter mail, though they may intercept at sea all mails coming out of and going into ports of the enemy's coasts which are effectively blockaded. The Governments of the United States, Great Britain and France, however, appear to be in substantial agreement as to principle. The method of applying the principle is the chief cause of difference.
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> Though giving assurances that they consider "genuine correspondence" to be "inviolable," and that they will, "true to their engagements," refrain "on the high seas" from seizing and confiscat-

ing such correspondence, the allied Governments proceed to deprive neutral Governments of the benefits of these assurances by seizing and confiscating mail from vessels in port instead of at sea. They compel neutral ships without just cause to enter their own ports or they induce shipping lines, through some form of duress, to send their mail ships *via* British ports, or they detain all vessels merely calling at British ports, thus acquiring by force or unjustifiable means an illegal jurisdiction. Acting upon this enforced jurisdiction, the authorities remove all mails, genuine correspondence as well as post parcels, take them to London, where every piece, even though of neutral origin and destination, is opened and critically examined to determine the "sincerity of their character," in accordance with the interpretation given that undefined phrase by the British and French censors. Finally the expurgated remainder is forwarded, frequently after irreparable delay, to its destination. Ships are detained *en route* to or from the United States or to or from other neutral countries, and mails are held and delayed several days and, in some cases, for weeks and even months, even though not routed to ports of North Europe *via* British ports. This has been the procedure which has been practiced since the announcement of February 15, 1916. To some extent the same practice was followed before that date, calling forth the protest of this Government on January 4, 1916. But to that protest the memorandum under acknowledgment makes no reference and is entirely unresponsive. . . . The practice actually followed by the allied powers must be said to justify the conclusion, therefore, that the announcement on February 15 was merely notice that one illegal practice had been abandoned to make place for the development of another more onerous and vexatious in character.

The present practice is a violation not only of the spirit of the announcement of February 15, but of the rule of The Hague Convention upon which it is concededly based. Aside from this, it is a violation of the prior practice of nations which Great Britain and her allies have in the past assisted to establish and maintain, notwithstanding the statement in the memorandum that "as late as 1907 the letters and despatches themselves could be seized and confiscated." During the war between the United States and Mexico the United States forces allowed British steamers to enter and depart from the port of Vera Cruz without molesting the mails intended for inland points. . . .

The same rule was followed by France, as I am advised, in the Franco-Prussian War of 1870; by the United States in the Spanish-American War of 1898; by Great Britain in the South African War, in the case of the German mail steamers *Bundesrath* and *General;* by Japan and substantially by Russia in the Russo-Japanese War of 1904. And even in the present war, as the memorandum of Great Britain and France states, their enemy, Germany, has desisted from the practice of interfering with neutral mails, even on board belligerent steamers. . . . It would seem, therefore, to be conclusively established that the interferences with mails of which this Government justly complains are wrong in principle and in practice.

The arbitrary methods employed by the British and French Governments have resulted most disastrously to citizens of the United States. Important papers which can never be duplicated, or can be duplicated only with great difficulty, such as United States patents for inventions, rare documents, legal papers relating to the settlement of estates, powers of attorney, fire insurance claims, income tax returns, and similar matters have been lost. Delays in receiving shipping documents have caused great loss and inconvenience by preventing prompt delivery of goods. . . . Business opportunities are lost by failure to transmit promptly bids, specifications, and contracts. . . . Checks, drafts, money orders, securities, and similar property are lost or detained for weeks and months. Business correspondence relating to legitimate and *bona fide* trade between neutral countries, correspondence of a personal nature, and also certain official correspondence, such as money-order lists and other matter forwarded by Government departments, are detained, lost, or possibly destroyed. . . . I can only add that this continuing offense has led to such losses to American citizens and to possible responsibility of the United States to repair them, that this Government will be compelled in the near future to press for full reclamation upon the attention of His Majesty's Government and that of the French Republic.

The principle being plain and definite, and the present practice of the Governments of Great Britain and France being clearly in contravention of the principle, I will state more in detail the position of the Government of the United States in regard to the treatment of certain classes of sealed mails under a strict application of the principle upon which our Governments seem to be in general accord. The Government of the United States is inclined to the opinion that the class of mail matter which includes stocks, bonds, coupons, and similar securities is to be regarded as of the same nature as merchandise or other articles of property and subject to the same exercise of belligerent rights. Money orders, checks, drafts, notes, and other negotiable instruments which may pass as the equivalent of money are, it is considered, also to be classed as merchandise. Correspondence, including shipping documents, money-order lists, and papers of that character, even though relating to "enemy supplies or exports," unless carried on the same ship as the property referred to, are, in the opinion of this Government, to be regarded as "genuine correspondence" and entitled to unmolested passage.

The Government of the United States, in view of the improper methods employed by the British and French authorities in interrupting mails passing between the United States and other neutral countries and between the United States and the enemies of Great Britain, can no longer tolerate the wrongs which citizens of the United States have suffered and continue to suffer through these methods. To submit to a lawless practice of this character would open the door to repeated violations of international law by the belligerent powers on the ground of military necessity of which the violator would be the sole judge. Manifestly a neutral nation can not permit its rights on the high seas to be determined by belligerents or the exercise of those rights to be permitted or denied arbitrarily by the Government of a warring nation. . . .

Only a radical change in the present British and French policy, restoring to the United States its full rights as a neutral power, will satisfy this Government.

Under an arrangement of the British censorship, provision was subsequently made that shipping documents placed in special bags marked to indicate their contents and forwarded on the same vessel that carried the goods to which they related should receive immediate and rapid examination by a special corps of censors at the point of arrival, so as to enable them to go forward by the same vessel.

British Use of the Censorship.—Considerable discussion has been caused by the charge made in certain business circles in the United States that Great Britain was using information obtained through her censorship of the mails for the benefit of British commerce to the detriment of commerce from neutral countries. This charge was emphatically denied in statements made by Lord Robert Cecil, Minister of War Trade, on Aug. 9 and Aug. 25. The following quotation from a statement to the Associated Press made by David Lloyd-George, then Secretary of War, on Sept. 15, indicates uses actually made of information obtained through the mail censorship:

When we get information that an American firm, to whom the Foreign Office has given a permit for the export of certain goods from Rotterdam, on the ground that these goods had been paid for before the war, is using that permit fraudulently, as frequently has been the case, we pass the information on to the Foreign Office in order that they may cancel the permit.

Again when we find that a neutral firm is using British banking facilities for the purpose of trading with our enemies and is deceiving the British banks in question as to the real purpose of the transaction, we pass that information on to the proper department in order that they may refuse to license the transaction.

Or, again, if we learn that a shipment of contraband, ostensibly from one neutral firm to another, is really destined for the enemy, we see that the Contraband Committee gets that information.

Retaliatory Action by Congress.—The following provision was inserted in the General Revenue Act of Sept. 8 (see also I, *The Sixty-fourth Congress*):

Sec. 104. That whenever, during the existence of a war in which the United States is not engaged, the President shall be satisfied that there is reasonable ground to believe that under the laws, regulations or practices of any belligerent country or government, American ships or American citizens or firms composed in part of American citizens or American companies or corporations are not accorded any of the facilities of commerce, including the unhampered traffic in mails which the vessels or citizens, firms, companies, or corporations of that belligerent country enjoy in the United States or its possessions, equal privileges or facilities of trade with vessels or citizens, firms, companies or corporations of any nationality other than that of such belligerent, the President is hereby authorized and empowered, in his discretion, to deny to the citizens, firms, companies, or corporations of such belligerent countries the use of the United States mails, or the facilities of any express company engaged in interstate commerce, or of any telegraph, wireless or cable company; and in such case he shall make a proclamation stating the denial of the use of the mails, or of the facilities of such express, telegraph, wireless, or cable company, or any or all of them, and the name of the country to whose citizens such privilege or privileges are denied.

Upon the making of such proclamation the use of said mails or facilities of such express, telegraph, wireless or cable company by any citizen, firm, company or corporation so prohibited shall be unlawful; and the President may change, modify, revoke, or renew such proclamation as in his opinion the public good may require.

Penalties of fine and imprisonment are provided for anyone using or furnishing such prohibited facilities.

The Allies' Contentions.—The long delayed reply of the British and French Governments to the American

note of May 24 was delivered in the form of a memorandum to the Secretary of State on Oct. 12. It conceded none of the contentions of the American Government, the nearest to a concession being the statement that "as regards shipping documents and commercial correspondence found on neutral vessels, even in an allied port and offering no interest of consequence as affecting the war, the allied Governments have instructed their authorities not to stop them but to see that they are forwarded with as little delay as possible." The salient portions of the memorandum are contained in the following paragraphs:

The allied Governments have found that their views agreed with those of the Government of the United States in regard to the postal union convention, which is recognized on both sides to be foreign to the questions now under consideration; post parcels, respectively, recognized as being under the common rule of merchandise subject to the exercise of belligerent rights, as provided by international law; the inspection of private mails to the end of ascertaining whether they do not contain contraband goods, and, if carried on an enemy ship, whether they do not contain enemy property. It is clear that that inspection, which necessarily implies the opening of covers so as to verify the contents, could not be carried on board without being attended with great confusion, causing serious delay to the mails, passengers, and cargoes, and without causing for the letters in transit errors, losses, or at least great risk of miscarriage.

On this first point and as regards vessels summoned on the high seas and compelled to make for an allied port, the Allied Governments have the honor to advise the Government of the United States that they have never subjected mails to a different treatment, according as they were found on a neutral vessel on the high seas or on neutral vessels, compelled to proceed to an allied port. They have always acknowledged that visits made in the port after a forced change of course must in this respect be on the same footing as a visit on the high seas and the criticism formulated by the Government of the United States does not, therefore, seem warranted.

As to the ships which of their own accord call at allied ports it is important to point out that in this case they are really "voluntarily" making the call. In calling at an allied port the master acts, not on any order from the allied authorities but solely carries out the instructions of the owner; neither are those instructions forced upon the said owner. In consideration of certain advantages derived from the call at an allied port, of which he is at full liberty to enjoy or refuse the benefits, the owner instructs his captain to call at this or that port. He does not, in truth, undergo any constraint.

In regard to the value to be attached to the eleventh convention of The Hague, 1907, it may first of all be observed that it only refers to mails found at sea and that it is entirely foreign to postal correspondence found on board ships in ports. In the second place, from the standpoint of the peculiar circumstances of the present war, the Government of the United States is aware that the Convention, as stated in the memorandum of the allies, has not been signed or ratified by six of the belligerent powers (Bulgaria, Italy, Montenegro, Russia, Serbia and Turkey); that for that very reason Germany availed itself of Article IX of the Convention and denied, so far as it was concerned, the obligatory character in these stipulations; and that for these several reasons the Convention possesses in truth but rather doubtful validity in law.

As a matter of fact, the lists of money orders, mailed from the United States to Germany and Austria-Hungary, correspond to moneys paid in the United States and payable by the German and Austro-Hungarian Post Offices. Those lists acquaint those Post Offices with the sums that have been paid there which in consequence they have to pay to the addressees. In practice, such payment is at the disposal of such addressees and is effected directly to them as soon as those lists arrive and without the requirement of the individual orders having come into the hands of the addressees. These lists are thus really actual money orders, transmitted in lump favor of several addressees. Nothing, in the opinion of the allied Governments, seems to justify the liberty granted to the enemy country so to receive funds intended to supply by that amount its financial resisting power.

The rights of the United States as a neutral cannot, in our opinion, imply the protection granted by the Federal Government to shipments, invoices, correspondence, or communications in any shape whatever, having an open or concealed hostile character and with a direct or indirect hostile destination, which American private persons can only effect at their own risk and peril.

A considerable portion of the note was given up to an attempt to refute the statements of the American note of May 24 as to the practice in previous wars. While some evidence was adduced as to regulations of belligerent governments permitting a certain amount of censorship of mail matter destined for the enemy, the British note shows little actual interference with mails in previous wars and seems on the whole decidedly to support the American contention as to the precedents.

The note concluded as follows:

Furthermore, should any abuses, grave errors, or derelictions, committed by the Allied authorities charged with the duty of inspecting mails, be disclosed to the Governments of France and Great Britain, they are now, as they ever were, ready to settle the responsibility therefor in accordance with the principles of law and justice, which it never was, and is not now, their intention to evade.

Swedish Retaliation and British Offers of Arbitration.—The principle of retaliation was resorted to by Sweden as a result of British interference with mails sent on Swedish vessels to and from that country. She seized British parcel-post mail passing through Sweden *en route* to Russia and refused to forward it as long as Great Britain refused to modify her attitude. The prohibition placed by Sweden on the exportation of wood pulp after Jan. 21 was also regarded as a retaliatory measure for Great Britain's seizure of Swedish mails.

In Sir Edward Grey's note of Jan. 31 to the Swedish Minister of Foreign Affairs, in reply to Sweden's protests against British interference, he stated:

I may, however, add that if, nevertheless, a neutral Government were to consider that the result of any particular judgment in the British Prize Court had in practice failed to give proper redress to one of their subjects, His Majesty's Government would be quite ready to listen sympathetically to any diplomatic representations on the subject and they do not exclude the possibility of settling the controversy by some reference to arbitration after the conclusion of the war.

On Feb. 11 the Swedish Government replied, stating its willingness to release the parcel-post mail for Russia provided the British Government declared itself willing without delay to submit to arbitration in accordance with The Hague Convention the question of British interference with Swedish mails. The British Government replied on Feb. 28, stating that it could not agree to the proposal that the question should be submitted to arbitration during the course of the war, and indicating that arbitration could be agreed to only in cases that had first been passed on by the prize courts, adding that the British prize courts were in the meantime open to Swedish subjects. On March 13 the Swedish Government replied, pointing out the delays and other difficulties attending prize-court procedure but nevertheless indicating its willingness to accept an arrangement by which Swedish subjects claiming to have suffered injury as a result of British belligerent operations during the course of the war and dissatisfied with the decisions pronounced by the British prize courts might have resort to arbitration. The Swedish Government, however, reserved to itself the right to resort to retaliatory measures in case further interference of the character complained of was resorted to by Great Britain.

The reply of Great Britain of April 25, further elucidated by the *note verbale* of the British Minister at Stockholm of June 5, definitely limited the cases that might be submitted to arbitration "to disputes about parcel mails carried on Swedish vessels." On June 29 the Swedish Government accepted the British proposition, pointing out, however, that the release of the parcel-post mails then held in Sweden did not imply that the Swedish Government would allow the uninterrupted transit through Sweden of such mails in the future. The British reply of July 6 characterized "the refusal of the Swedish Government to transmit further parcels mail between the United Kingdom and Russia" as "a violation of the agreement concluded between the British and Swedish postoffices in 1904," and added that this refusal "renders the present proposal of the Swedish Government entirely unsatisfactory," and stated that unless the Swedish Government would engage to allow uninterrupted transit in the future to such parcel-post mails, "His Majesty's Government must withdraw all the offers of arbitration they have made." On July 24 the Swedish Government addressed a note to the British Secretary for Foreign Affairs, expressing surprise at his note of July 6, as the unreserved acceptance by the Swedish Government of the offer of the British Government, which contained no reference to Sweden's attitude toward future shipments of parcel post through that country, was regarded as a convention, virtually

concluded, which only remained to be drawn up in final form, stating that in accordance with this interpretation the detained parcel post for Russia had already been ordered to be released. A further exchange of notes led no further, the Swedish Government insisting on its right to deal with future shipments of parcel post in accordance with future circumstances.

MISCELLANEOUS

Rights in a Prize in a Neutral Port: The "Appam" Case.—On Feb. 1 the British steamer *Appam* arrived at Newport News in charge of a German prize crew. She carried also, in addition to her passengers and certain Germans whom she had been taking to England as prisoners, the crews of seven other British vessels captured and sunk by the German raider *Möwe*. Ambassador von Bernstorff immediately notified Secretary Lansing of her arrival, stating that the commander expected, "in accordance with Article XIX of the Prusso-American Treaty of 1799, to stay in an American port until further notice." He added that the *Appam* had not been converted into an auxiliary cruiser, was not armed, and had made no prizes since her capture. Sir Cecil Spring-Rice, on behalf of the British Government, addressed a memorandum to the State Department requesting that if the *Appam* were regarded by the United States Government as a prize, she be returned to her owners and the prize crew interned, citing Article 21 of the Hague Convention XIII of 1907, which, though it had not been ratified by Great Britain, should, it was claimed, be applied to the *Appam*, as embodying a generally recognized principle of international law.

Article XIX of the treaty with Prussia of 1799, as still in force, provides:

> The vessels of war, public and private, of both parties, shall carry (*conduire*) freely, wheresoever they please, the vessels and effects taken (*pris*) from their enemies, without being obliged to pay any duties, charges, or fees to officers of admiralty, of the customs, or any others; nor shall such prizes (*prises*) be arrested, searched, or put under legal process, when they come to and enter the ports of the other party, but may freely be carried (*conduites*) out again at any time by their captors (*le vaisseau preneur*) to the places expressed in their commissions, which the commanding officer of such vessel (*le dit vaisseau*) shall be obliged to show.

Article 21 of the Hague Convention XIII provides:

> A prize may only be brought into a neutral port on account of unseaworthiness, stress of weather, or want of fuel or provisions. It must leave as soon as the circumstances which justified its entry are at an end. If it does not, the neutral power must order it to leave at once; should it fail to obey, the neutral power must employ the means at its disposal to release it with its officers and crew and to intern the prize crew.

Article 22 of the same convention provides:

> A neutral power must, similarly, release a prize brought into one of its ports under circumstances other than those referred to in Article 21.

The State Department promptly ruled that all persons on board the *Appam* should be allowed to leave the vessel except the German prize crew and such other persons as might have coöperated with the prize crew in navigating the vessel. No reply, however, was made to the German Ambassador's note until March 2, when the Secretary of State informed the Ambassador that the Department did not regard Article XIX of the treaty with Prussia as applicable to the case of the *Appam* as the latter was not brought into port by a captor vessel and the commission of the prize master directed him to bring her to the nearest American port and "there lay her up." The terms of Article XIX of the treaty referred specifically to capturing vessels which were allowed the privilege of carrying out prizes "to the places expressed in their commissions." Obviously, Secretary Lansing's note argued, the treaty did not refer to prizes arriving without convoy, intending to make the port of refuge "a port of ultimate destination or indefinite asylum."

Meanwhile, a libel had been filed in the U. S. District Court by the British and African Steam Navigation Co., the owners of the *Appam*, for the recovery of the vessel. Against the jurisdiction of the Court, the German Ambassador had protested on

Feb. 22, citing the same article of the Prussian treaty. The Department of State in its note of March 2 refused to interfere with the Court, which would have to decide for itself the question of jurisdiction.

The detention of the *Appam* in an American port for several weeks before suit was instituted was characterized by the British Ambassador on March 31 as a breach of neutrality. The Ambassador was informed, however, that as the Department of State was considering the case and had arrived at no decision prior to the filing of the libel, there could be no breach of neutrality. An offer made by the German Ambassador on March 16 to arbitrate the question of the applicability of Article XIX of the Prusso-American Treaty to the case of the *Appam*, "provided that the *status quo* of the steamship *Appam* will remain unchanged throughout the arbitration proceedings and that the steamer will be allowed to remain with her prize crew in an American port during that time," was rejected by the Department of State on April 7 on the ground that "its acceptance would manifestly defeat the very object of the United States in its reservation to Article 23 of Convention XIII by allowing the prize to remain in an American port for an indefinite period while the arbitration proceedings were in progress, which might continue until after peace is restored." The note stated further that

> in these circumstances the Government of the United States can only accept the proposal of the German Government for the arbitration of the meaning of Article XIX of the treaty of 1799, upon the understanding that the *Appam* depart from the territorial jurisdiction of the United States, in the event that the libel is dismissed by the court and after she has had a reasonable time to take on board such supplies as may be necessary, in the judgment of this Government, for a voyage to the nearest port subject to the sovereignty of Germany; and failing this, that she be released and the prize master and crew be interned for the remainder of the war.

On July 29 Judge Waddill of the U. S. District Court at Norfolk, Va., rendered a decision to the effect that the *Appam* was the property of the British owners. He decided in favor of the jurisdiction of the Court and followed Secretary Lansing's interpretation of the Prusso-American Treaty. The rule of Article 21 of the Hague Convention was applied to the case as being, in fact, the accepted rule of international law. The Court concluded "that the manner of bringing the *Appam* into the waters of the United States, as well as her presence in those waters, constitutes a violation of the neutrality of the United States; that she came in without bidding or permission; that she is here in violation of the law." Appeal was taken from the decision of the Court, but the case had made no further progress up to the end of the year.

Removal of Civilian Passengers from American Vessel: The "China" Case.—On Feb. 18 the British auxiliary cruiser *Laurentic* stopped the American steamer *China, en route* from Shanghai to Manila, about ten miles from the mouth of the Yangtsekiang River and removed 38 German, Austrian and Turkish passengers. It was not claimed that these passengers belonged to the armed forces of the enemy, but in justification of her action Great Britain stated that they were plotting against the British Government in India. The American Government refused to accept this explanation, and as a result of renewed protests the British Government on May 5 agreed to release the persons taken and expressed regret at the occurrence. Some time passed before the release actually occurred, however. After renewed inquiries from the Department of State, the British Government announced, on Sept. 22, that arrangements had been made for their release and that they would leave Sydney, N. S. W., where they had been detained, on Sept. 28.

American Relief Activities.—Although the Commission for Relief in Belgium continued in operation throughout the year and permission was finally obtained from the Turkish Government for the shipment of supplies to Syria, where the population was said to be in dire need of the prime necessities of life, relief efforts of the American Government in other directions were blocked by the attitude of Great Britain and her allies toward the shipment of supplies to the Central European coun-

tries or territory occupied by the Teutonic powers.

After the withdrawal of the American Red Cross units in Germany and Austria-Hungary, due to lack of funds, opposition developed on the part of Great Britain to the shipment of medical and hospital supplies to these countries. Although the American Red Cross offered to send to Germany "a commission of satisfactory persons" to receive the shipments and "superintend their distribution to hospitals and to supervise their use," Great Britain still refused to allow their shipment except to American hospital units. The request of the American Government for assurances of non-interference with such shipments had been based upon the provisions of the Geneva Convention, to which all the belligerent powers, as well as the United States, were signatories, that articles serving exclusively to aid the sick and wounded should be allowed safe conduct to their destination. The reply of the British Government of July 12 contented itself with denying the need of these articles in Germany.

Efforts to establish a system of relief in Poland under an American commission similar to that operating in Belgium failed because of conditions imposed by Great Britain and her allies which were regarded as unacceptable by Germany. These conditions, as finally reduced to a minimum, amounted to a guarantee by Germany not only that supplies in occupied Polish territory would not be exported but would not be used by the army of occupation. In an endeavor to overcome the divergencies between the positions of the Entente and the Central Powers, the President in July sent personal letters to the rulers of Great Britain, France, Russia, Germany and Austria-Hungary, urging their benevolent consideration of the matter to the end that an agreement be obtained. The President's efforts, however, failed to bring any tangible results.

Deportations of Belgian Civilians.—In the fall of 1916 regulations were formulated by the German administration of Belgium for the deportation to Germany of such Belgians as were unable or unwilling to obtain work in Belgium. Although the United States did not have charge of Belgian interests, which were in the hands of the Spanish Minister, the Department of State on Nov. 29 instructed the chargé d'affaires of the American Embassy at Berlin to obtain an interview with the German Chancellor and read him the following note:

> The Government of the United States has learned with the greatest concern and regret of the policy of the German Government to deport from Belgium a portion of the civilian population for the purpose of forcing them to labor in Germany, and is constrained to protest in a friendly spirit, but most solemnly, against this action, which is in contravention of all precedents and of those humane principles of international practice which have long been accepted and followed by civilized nations in their treatment of non-combatants.
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> Furthermore, the Government of the United States is convinced that the effect of this policy, if pursued, will in all probability be fatal to the Belgian relief work, so humanely planned and so successfully carried out, a result which would be generally deplored and which, it is assumed, would seriously embarrass the German Government.

Representations were made also by the Spanish and other neutral Governments and by the Vatican.

The German Government in its reply to the representations of the United States stated that the application to Belgium by the Governments of Great Britain and her Allies of the principle of the British order-in-council of March 11, 1915, prohibiting overseas trade in goods of German or Austrian origin except when special license was granted by Great Britain in the case of individual shipments, resulted in closing most of the Belgian factories and had brought much unemployment and destitution in its wake; the deportations to Germany had become a social necessity, since it was impossible to find work in Belgium for those deported. The German Government added that the United States was evidently misinformed as to the extent and character of the "deportations," that most of the Belgians had gone to Germany voluntarily and were contented with their lot, and that all were employed in occupations permissible under international law, such as agricultural and industrial pursuits, and not in connection with military operations

as reported from Entente sources, and hence that Germany was acting in entire conformity with Article 43 of the Hague Convention in regard to the measures which a belligerent may take for the maintenance of order in occupied territory. The German Government expressed its regret if Belgian relief were to be affected as a result of these measures. The American Embassy was invited to inspect Belgian workmen's camps in order to convince itself of the true facts in the case.

INTERNATIONAL RELATIONS OF THE UNITED STATES

II. WITH LATIN AMERICA

MEXICO

The Columbus Raid.—In reply to a Senate Resolution of Jan. 6, Secretary Lansing transmitted to the Senate through the President a list of Americans killed in Mexico, prefaced by a review of the situation and an estimate of conditions as they then existed in Mexico. The death toll, according to this statement, was 76 lives in 1913 to 1915, as against 47 from 1910 to and including 1912. The difficulties with which the *de facto* Government of First Chief Carranza had to contend were pointed out, and the Secretary stated

> that the *de facto* Government is now in control of all but a few sections of Mexico and that, bearing in mind that the nation is just emerging from years of domestic strife, it may be said that within the territory which it controls it is affording in all the circumstances reasonably adequate protection to the lives and properties of American citizens, and it is taking steps to extend its authority over and to restore order in sections now in the hands of the hostile factions.

The nomination of Henry P. Fletcher as Ambassador to Mexico was ratified by the Senate shortly thereafter.

This was the situation when on March 9 a band of Villistas, presumably under the personal direction of Villa, who had been threatening injury to Americans as a result of the recognition of Carranza and the privileges that went therewith (*A. Y. B.*, 1915, p. 118), attacked the town of Columbus, N. M., under cover of night, killing nine civilians and eight soldiers and committing depredations. Decisive action to meet the situation was promptly determined upon. A statement from the White House was given out to the effect that

> an adequate force will be sent at once in pursuit of Villa, with the single object of capturing him and putting a stop to his forays. This can and will be done in entirely friendly aid of the constituted authorities in Mexico and with scrupulous respect for the sovereignty of that republic.

On the day following the attack, Carranza sent a note to the United States Government expressing his grief at the occurrence, and, after citing the previous treaty and the precedents of the eighties, under which reciprocal rights of pursuit of bandits across the border were exercised by the United States and Mexico, proposed that the military forces of the *de facto* Government be allowed to pursue bandits or outlaws across the border into the United States in return for reciprocal rights to be exercised on occasion by the United States. On March 13 the proposition was agreed to by the Government of the United States, Secretary Lansing stating in his note of acceptance:

> The Government of the United States understands that, in view of its agreement to this reciprocal arrangement proposed by the *de facto* Government, the arrangement is now complete and in force, and the reciprocal privileges thereunder may accordingly be exercised by either Government without further exchange of views.

At the same time the Secretary of State issued the following statement:

> In order to remove any misapprehension that may exist either in the United States or in Mexico, the President has authorized me to give in his name the public assurance that the military operations now in contemplation by this Government will be scrupulously confined to the object already announced, and that in no circumstances will they be suffered to infringe in any degree upon the sovereignty of Mexico, our sister Republic. On the contrary, what is now being done is deliberately intended to preclude the possibility of intervention.

Entry of American Troops into Mexico.—On March 15 a military expedition under command of General

Pershing consisting of about 12,000 men, including artillery, entered Mexico (for the military operations in Mexico, see XII, *The Army*), and a prohibition was placed on the shipment of arms, ammunition or explosives, "except such as it is clearly established are designed for the *de facto* Government."

On March 17 the Government of Carranza sent a note to the Department of State complaining of the entry of the punitive expedition without notification to the *de facto* Government or the civil or military authorities of the territory through which the expedition had to pass. Although indicating that it was still willing to enter into an agreement for reciprocal privileges of crossing the border, the *de facto* Government claimed that a "false interpretation was being given to the text of its note of March 10," as "no expedition could be sent until the terms and conditions of the agreement on the subject should become definite" (note of April 13 from the Confidential Agent of the *de facto* Government to the Secretary of State), further insisting that the reciprocal passage of troops should be permitted only "provided, unfortunately, there should be repeated in future irruptions such as that as occurred at Columbus or of any other kind at some place along the boundary line." On March 18 a draft of agreement was submitted by the Confidential Agent of the Mexican Government to the Acting Secretary of State, who, according to the note of Confidential Agent Arredondo of April 13, expressed his regret that the Department had not "received the observations of the Mexican Government prior to the passage of the American forces over the boundary . . . and he assured him that the passage of these troops took place with the best of good faith in the understanding that it would not be necessary to enter into further details of the agreement which was considered final and conclusive." A request made to the Carranza Government on March 19 through Special Representative Rodgers for permission to send supplies for General Pershing's troops over the Northwestern Railway of Mexico was refused.

The draft of agreement submitted by the Mexican Government limited the activity of any American forces operating in Mexico thereunder by restrictions as to duration of stay, zone of operations, number of soldiers, and class of arms. A counter draft was submitted by the Department of State on April 3, accompanied by a note stating "that the American Government trusts that the conditions set forth in the said agreement will not apply to the American forces at present on Mexican territory" (note of Mr. Arredondo, April 13). The Secretary of Foreign Relations of the *de facto* Government replied on April 13 that in view of the unwillingness of the Government of the United States to have the proposed agreement apply to the operation of American troops already in Mexico, "the Government of Mexico believes it is advisable for the present to suspend all discussions or negotiations relative to the matter." "And considering," the note concluded,

> that the expedition sent by the Government of the United States to pursue Villa is without warrant, under the circumstances, because there existed no previous formal or definite understanding; and because this expedition is not fulfilling its object and undoubtedly can not do so, because the band headed by Villa has already been dispersed; and finally because there are sufficient Mexican troops to pursue him and that more forces are being sent to exterminate the rest of the dispersed band, the First Chief of the Constitutionalist Army, invested with the executive power of the Union, considers that it is now the time to treat with the Government of the United States upon the subject of the withdrawal of its forces from our territory.

The Scott-Obregon Conference.—American forces pursued the Mexican bandits as far as Parral, "where the pursuit was halted by the hostility of Mexicans, presumed to be loyal to the *de facto* Government" (Secretary Lansing's note of June 20 to the Secretary of Foreign Relations of the *de facto* Government), who attacked American troops who tried to enter that place, killing and wounding several American soldiers in the encounter. Reports also came of the massing of Carranzist troops in the region occupied by the American forces. General Scott, Chief of Staff, went to

the border on April 19 to investigate conditions, and a conference was arranged between Generals Scott and Funston and General Obregon, the Mexican Secretary of War, in an endeavor to straighten out existing difficulties. The conference began sessions on April 29 at El Paso, but although the meetings of the American and Mexican conferees were marked by a spirit of frank cordiality, no agreement was reached because of the insistence of General Obregon upon the immediate withdrawal of American troops from Mexico as a *sine qua non*. On May 2 the conferees signed a memorandum *ad referendum* stating that "the American punitive expeditionary forces have destroyed or dispersed many of the lawless elements and bandits . . . or have driven them far into the interior of the Republic of Mexico," and were then "carrying on a vigorous pursuit of such small numbers of bandits or lawless elements as may have escaped"; and that in view of these facts, as well as the assurances that the forces of the *de facto* Government were "at the present time being augmented and strengthened to such an extent that they will be able to prevent any disorders occurring in Mexico that would in any way endanger American territory," and that they would "continue to diligently pursue, capture or destroy any lawless bands of bandits that may still exist or hereafter exist in the northern part of Mexico," and that the *de facto* Government would make a further distribution of such of its forces as might be necessary to prevent the possibility of invasion of American territory from Mexico," the American Government declared that the American forces would be "gradually withdrawn." Although the American Government signified its willingness to ratify the memorandum, General Carranza refused to do so.

Demands for Withdrawal of the American Force.—A second raid across the border occurred on May 6, when a small band of Villistas entered and looted the town of Glenn Springs, Tex., killing three American soldiers and two civilians. On May 10 American troops crossed the international boundary in pursuit of these marauders, and penetrated 168 miles into Mexican territory "without encountering a detachment of Mexican troops or a single Mexican soldier" (Secretary Lansing's note of July 20), recrossing into Texas on May 22.

On May 22 the Mexican Secretary of Foreign Affairs addressed a note to the Secretary of State reviewing the events of the past two months in anything but temperate language, insisting "that the American Government explain its true attitude toward Mexico" and immediately withdraw its troops. The argument and tone of the note can be judged from the imputations of the following paragraphs:

> The American Government prefers to maintain its troops inactive and idle on Mexican territory rather than to withdraw them and station them along the border by arrangement with the Mexican authorities who would agree to do the same. By acting as it has the American Government leads us to suppose that its real intention is to keep these troops in Mexico in the event that it may need them there later for future operations.
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> The American Government on every occasion has declared itself as desirous of assisting the Constitutionalist Government in concluding its work of pacification, and of accomplishing this in the shortest possible time. The real attitude of the American Government in connection with these desires appears incongruous, as, for some time past, it has been committing various acts which indicate that it not only does not lend its aid in the pacification of Mexico but that, on the contrary, it seems to place every possible obstacle in the way of attaining such an end. In reality, without considering the great volume of diplomatic representations which under the pretext of protection of established American interests in Mexico, constantly impede the labor of the new Government in its efforts to reorganize the political, economic and social conditions of the country on new bases, a large number of other acts seem to show that the influence of the American Government is directed against the consolidation of the present Mexican Government.
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> The decided aid lent at one time to Villa by General Scott and the Department of State was itself the principal cause of the prolonged civil war in Mexico. Later the continuous aid extended by the American Catholic clergy to that of Mexico, which labored unceasingly against the Constitutionalist Government, and the constant activity of the American press favoring intervention and the interests of the business men of the United States, are still further indications that the present American Government can not or will not prevent the work of conspiracy

which is being effected in the United States against the Constitutionalist Government.

The American Government incessantly demands from the Mexican Government an effective protection of its frontier, and yet the greater part of the bands which take the name of rebels against this Government are cared for and armed, if they are not also organized, on the American side under the tolerance of the authorities of the State of Texas, and, it may even be said, that of the Federal authorities of the United States. The leniency of the American authorities respecting these bands is such that in a majority of the cases the conspirators, who are well known, when they have been discovered and taken to prison, obtain their liberty by insignificant promises which allow them to continue in their efforts.

The embargo on stores consigned to the Mexican Government can be interpreted in no other way than that the American Government desired to be on its guard against the emergency of a possible future conflict and for that reason tries to prevent arms and stores from reaching the Mexican Government, as they may eventually be used against the Americans themselves. The American Government would be within its rights in guarding against such an emergency, but in such a case it should not claim that it is trying to coöperate with the Mexican Government, and it would be better to show a greater frankness in its procedure.

The reply of the American Government of June 20 began with an expression of "surprise and regret" at the "discourteous tone and temper" of the Mexican note, and proceeded with an indictment of conditions in Mexico and of the course of the Carranza Government:

The Government of the United States has viewed with deep concern and increasing disappointment the progress of the revolution in Mexico. Continuous bloodshed and disorders have marked its progress. For three years the Mexican Republic has been torn with civil strife; the lives of Americans and other aliens have been sacrificed; vast properties developed by American capital and enterprise have been destroyed or rendered non-productive; bandits have been permitted to roam at will through the territory contiguous to the United States and to seize, without punishment or without effective attempt at punishment, the property of Americans, while the lives of citizens of the United States who ventured to remain in Mexican territory or to return there to protect their interests have been taken, and in some cases barbarously taken, and the murderers have neither been apprehended nor brought to justice.

The attacks on Brownsville, Red House Ferry, Progreso Post Office, and Las Peladas, all occurring during September last, are typical. In these attacks on American territory, Carrancista adherents, and even Carrancista soldiers, took part in the looting, burning and killing. . . . So far has the indifference of the *de facto* Government to these atrocities gone that some of these leaders, as I am advised, have received not only the protection of that Government, but encouragement and aid as well.

Facts were cited to substantiate these charges and the note proceeded to the dispatch of American troops into Mexico, with reference to which it stated:

Obviously, as immediate action alone could avail, there was no opportunity to reach an agreement (other than that of March 10th-13th now repudiated by General Carranza) prior to the entrance of such an expedition into Mexico if the expedition was to be effective. Subsequent events and correspondence have demonstrated to the satisfaction of this Government that General Carranza would not have entered into any agreement providing for an effective plan for the capture and destruction of the Villa bands.

A further review of the events led to the conclusion

that the *de facto* Government, in spite of the crimes committed and the sinister designs of Villa and his followers, did not and does not now intend or desire that these outlaws should be captured, destroyed, or dispersed by American troops or, at the request of this Government, by Mexican troops.

The charges of the Mexican Government that the American Government has impeded the pacification and rehabilitation of Mexico were taken up *seriatim* and refuted, emphasis being laid on the great forbearance shown by this Government under grave provocation. The charge was made that the Carranza forces never in any way coöperated with the American troops or made any material effort of their own toward the capture of the Villa bandits, and the hostility of subordinate Carranzist commanders was instanced as one cause of the failure of the expedition completely to fulfil its purpose. The note added:

It is unreasonable to expect the United States to withdraw its forces from Mexican territory or to prevent their entry again when their presence is the only check upon further bandit outrages and the only efficient means of protecting American lives and homes—safeguards which General Carranza, though internationally obligated to supply, is manifestly unable or unwilling to give.

The charge that the United States had territorial aspirations in Mexico was indignantly denied. The statement that

> the United States Government can not and will not allow bands of lawless men to establish themselves upon its borders with liberty to invade and plunder American territory with impunity and, when pursued, to seek safety across the Rio Grande, relying upon the plea of their Government that the integrity of the soil of the Mexican Republic must not be violated,

was followed by a definite refusal to entertain the "request of the *de facto* Government" for the withdrawal of American troops from Mexico. The note concluded in unmistakable terms:

> Whenever Mexico will assume and effectively exercise that responsibility the United States, as it has many times before publicly declared, will be glad to have this obligation fulfilled by the *de facto* Government of Mexico. If, on the contrary, the *de facto* Government is pleased to ignore this obligation and to believe that "in case of a refusal to retire these troops there is no further recourse than to defend its territory by an appeal to arms," the Government of the United States would surely be lacking in sincerity and friendship if it did not frankly impress upon the *de facto* Government that the execution of this threat will lead to the gravest consequences. While this Government would deeply regret such a result, it cannot recede from its settled determination to maintain its national rights and to perform its full duty in preventing further invasions of the territory of the United States and in removing the peril which Americans along the international boundary have borne with patience and forbearance.

Copies of this note were sent to the diplomatic representatives at Washington of all the Latin-American republics with this comment:

> Should this situation eventuate into hostilities, which this Government would deeply regret and will use every honorable effort to avoid, I take this opportunity to inform you that this Government would have for its object, not intervention in Mexican affairs, with all the regrettable consequences which might result from such a policy, but the defense of American territory from further invasion by bands of armed Mexicans, protection of American citizens and property along the boundary from outrages committed by such bandits, and the prevention of future depredations by force of arms against the marauders infesting this region and against a Government which is encouraging and aiding them in their activities.

On June 18 the President called out substantially the whole organized militia of the country for service along the Mexican border (see also XII, *The Army*).

The Carrizal Incident.—On June 16 General Trevino, in command of the Mexican troops in the district occupied by General Pershing's forces, received orders from the Mexican War Department "not to permit American forces from General Pershing's column to advance further south, or move either east or west from the points where they are located, and to oppose new incursions of American soldiers into Mexican territory." These orders were brought to the attention of General Pershing, and on June 22 a force of less than 100 men, moving away from the main body of troops, was attacked as they were about to enter the small town of Carrizal, after the refusal of the local commander, in accordance with the understanding between the American and Mexican forces in regard to the entry of towns, to permit them to do so. Several officers and a score of troopers were killed and 17 American soldiers made prisoners. Notification of this order and the attack resulting therefrom were made in a note delivered by the Confidential Agent of the Mexican Government on June 24. The following day Secretary Lansing telegraphed the Special Representative of the State Department in Mexico, for communication to the Government of Carranza, that the Government of the United States could "put no other interpretation" upon the note of June 24 "than that it is intended as a formal avowal of deliberately hostile action against the forces of the United States . . . and of the purpose to attack them without provocation whenever they move from their present position in pursuance of the objects for which they were sent there;" demanding "the immediate release of the prisoners taken in the encounter at Carrizal, together with any property taken with them." "The Government of the United States," the telegram concluded, "expects an early statement from your Government as to the course of action it wishes the Government of the United States to understand it has determined upon, and . . . it also expects that this statement be made through the usual

diplomatic channels, and not through subordinate military commanders."

The prisoners taken at Carrizal were released on June 26, and on July 4 General Carranza indicated his willingness to consider "in a spirit of accord" remedies which should be applied to the present situation, suggesting the acceptance of offers of mediation of the Latin-American republics. As a result of a preliminary conversation between the Bolivian Minister and Secretary Lansing, the Latin-American republics which had been considering the matter decided not to make offers of mediation. On July 17 the American Government replied that it was prepared immediately to exchange views as to a practical plan to remove finally and prevent a recurrence of the difficulties which had been the source of controversy. On July 3 the American forces were withdrawn to El Valle, 150 miles from the border.

The Joint Commission.—The Mexican Government proposed on July 12 the naming of three commissioners by each Government,

> to hold a conference and resolve at once the point regarding the definite withdrawal of the American forces now in Mexico, draft a protocol of agreement regarding the reciprocal crossing of forces and investigate the origin of the incursions taking place up to date, so as to be able to ascertain responsibility and arrange definitely the pending difficulties or those that may arise between the two countries in the future, all this to be subject to the approval of both Governments.

To this note the American Government replied, accepting the proposal "in the spirit of frank cordiality in which it is made." An enlargement of "the powers of the proposed commission," however, was suggested, so that "such other matters the friendly arrangement of which would tend to improve the relations of the two countries" might be considered. General Carranza replied that he had named his commissioners and had instructed them to deal "preferably" with the questions of the withdrawal of American troops and the patrol of the border. Informal negotiations then proceeded between Acting Secretary Polk and Mr. Arredondo and arrangements for the commission were made. General Carranza appointed as commissioners Luis Cabrera, Minister of Finance, chairman; Ignacio Bonillas, Minister of Communications; and Alberto J. Pani, Director of Railways. To confer with these President Wilson named: Franklin K. Lane, Secretary of the Interior; Judge George Gray; and Dr. J. R. Mott. The meetings were held at New London, Conn., and later at Atlantic City.

A wide range of subjects, including financial and industrial conditions in Mexico, American neutrality laws with reference to border conditions, extradition of Mexicans, and mining and taxation decrees of the Carranza Government, were considered by the commissioners. Reports that these subjects were under discussion brought forth further instructions from Carranza that the commissioners should confine their attention to the two questions of the withdrawal of the American troops and the patrol of the border. The Mexican commissioners then gave out a statement to the effect that no other subjects than the two designated by Carranza had been "discussed" but that they had on request furnished information on the other subjects mentioned to the American commissioners so as to enable them better to understand the primary questions under discussion from all angles.

The Protocol.—On Nov. 24 it was announced that an agreement had been signed by the Mexican and American Commissioners, subject to the approval of the two Governments, and that Mr. Pani was leaving for Mexico in order to obtain the approval of General Carranza. It was stated that if the agreement and memorandum were approved, further meetings of the Commission would be held, beginning Dec. 8, to resume the discussion of questions not included in the agreement, especially the protection of life and property of Americans and other foreigners in Mexico.

The following was announced to be a paraphrase of the agreement:

> First.—The American troops now in Chihuahua, commanded by General John J. Pershing, shall be withdrawn within forty days from the approval of the protocol by the respective governments, provided that within that time the conditions in that part of Mexico have not become such as to endanger the Ameri-

can border. In such event the time shall be extended.

Second.—The Mexican army shall patrol the Mexican side of the border and the American army the American side, but this shall not preclude cooperation between the two forces to preserve peace upon the border.

Third.—It shall be left to the commanding officers of the armies on the border of both nations to enter into such arrangements for coöperation in operations against bandits whenever it is possible.

In view of the opposition of the Mexican commissioners to any reference in the agreement to the right of American troops to enter Mexico in the future, this subject was covered in a supplemental memorandum, in which the American Government reserved to itself the right to pursue into Mexico marauders coming into the United States from Mexico as long as the present abnormal conditions in northern Mexico continue. The American Government refused to agree to any limitations with reference to the number and kind of troops, zone of operations, etc., which the Mexican commissioners desired to have incorporated in the memorandum.

Before the end of the year, however, it became known that General Carranza had refused to ratify the protocol, his reason apparently being that ratification would carry with it an approval of the further stay of American troops on Mexican territory.

NICARAGUA

Ratification of the Nicaraguan Treaty.—On Feb. 18 the United States Senate, by a vote of 55 to 18, advised ratification of the treaty of Aug. 5, 1913, with Nicaragua (*A. Y. B.*, 1914, p. 91), by which the United States obtains exclusive right in perpetuity for the building, operation and maintenance of an oceanic canal through Nicaraguan territory by way of the Lake of Nicaragua and the San Juan river, or any other route, and a 99-year lease of Great Corn and Little Corn Islands and territory to be selected by the United States on the Bay of Fonseca for use as a naval base. For these rights the sum of $3,000,000 was to be paid

for the benefit of the Republic of Nicaragua—to be deposited to the credit of the Government of Nicaragua in such bank or banks or banking corporations as the Government of the United States may determine, to be applied by Nicaragua upon its indebtedness or other public purposes for the advancement of the welfare of Nicaragua in a manner to be determined by the two High Contracting Parties, all such disbursements to be made by orders drawn by the Minister of Finance of the Republic of Nicaragua and approved by the Secretary of State of the United States, or by such person as he may designate.

Protests of Other Central American States.—When the provisions of this treaty first became known, Costa Rica, Salvador and Honduras all protested to the Department of State against its ratification on the ground that their rights were affected thereby. In order to meet the objections of the protesting republics, a declaration was embodied by the Senate in its resolution of ratification, stating that "in advising and consenting to the ratification of the said convention . . . such advice and consent were given with the understanding to be expressed as a part of the instrument of ratification that nothing in such convention is intended to affect any existing right or any of the said named States" (Costa Rica, Salvador and Honduras). On May 26 Costa Rica brought suit against Nicaragua for infringement of rights in the Central American Court of Justice, a tribunal established in 1907 with equal representation from each of the five Central-American states for the purpose of the peaceful settlement of disputes between these five countries. Salvador also entered suit against Nicaragua before the same tribunal.

The position of Costa Rica was that as any canal constructed across Nicaragua would probably make use of the San Juan River, which forms the boundary between Nicaragua and Costa Rica, the canal could not be built without affecting her lands and waters and therefore she should have been consulted before any rights that might involve the San Juan River were ceded. Salvador and Honduras claimed they should have been consulted before conceding any rights to a naval base on the Bay of Fonseca, which also washes their territory. Their position apparently is that there is a community of interest which really amounts to a joint jurisdiction over the bay. Honduran coasts are within

range of artillery placed at practically any spot along the Nicaraguan shores of the bay, and it was claimed that the existence of such a naval base would in fact menace the perpetual neutrality of Honduras as provided for in the treaty of Dec. 20, 1907, concluded between the Central American states at the Central American Peace Conference held in Washington at the invitation of the United States and Mexico. To these contentions the following statement of the Nicaraguan Foreign Office made categoric reply:

> The mere claim to restrict the legitimate action of Nicaragua over the whole or any part of the territory which belongs to her as a sovereign nation on the ground of alleged dangers and of *sui generis* solidarity by which the neighboring country completely and absolutely and upon that ground acquires for its own and exclusive benefit unalienable rights of the true owner is excessive and beyond every principle of international justice and rectitude that it cannot be thought for a moment that there should be a people who would be willing to consent to a discussion of such questions under such an aspect.

Decision was rendered by the Central American Court of Justice in favor of Costa Rica, and subsequently also in favor of Salvador, but Nicaragua declined to accept the finding of the court. It may be noted that the three countries, Salvador, Costa Rica and Honduras, that claimed an infringement of their rights by the treaty possessed a majority of the members of the Court.

On Nov. 3 it was announced that Colombia also had protested against the treaty with Nicaragua on the ground that the lease of the Great Corn and Little Corn Islands was a denial of Colombian sovereignty therein. Colombia claimed under a *cedula* of the King of Spain of Nov. 30, 1803, demarcating the various Spanish provinces in America.

HAITI AND THE DOMINICAN REPUBLIC

Haiti. — The treaty between the United States and Haiti (*A. Y. B.*, 1915, p. 119) was favorably acted upon by the United States Senate on Feb. 28, and was proclaimed on May 3. Appointments were made thereunder and a "receivership" staff organized to take over the work of the collection and application of the customs duties from the paymasters of the navy, who had been temporarily discharging that function. On Aug. 24 a protocol to this above treaty was signed in Washington arranging the details of the establishment of the native constabulary under the command of American officers. It is understood that the American marines will be gradually withdrawn from Haiti after the new constabulary is organized and put into operation.

The Dominican Republic.—On May 2 the Dominican Congress voted to impeach President Jimenez for violation of the Constitution in connection with the drafting of the budget (see also IV, *Latin America*), and Admiral Caperton and a strong force of marines were promptly dispatched to Santo Domingo. Upon the revolt of the garrison at Santo Domingo to General Arias, the Minister of War in the Cabinet of President Jimenez, the President with the loyal members of his Cabinet withdrew to San Geronimo, a suburb of Santo Domingo, and established the capital there. American marines were landed to keep order, and, hostilities between the two factions being threatened, General Arias was notified by the American Minister and Admiral Caperton to abandon the capital within 72 hours. This Arias agreed to do provided the President resigned. The President agreed and Arias and his followers left the town within the time designated. Contingents of marines were then dispatched to various parts of the Republic to maintain order and several altercations with revolutionists occurred. The Dominican Congress was also informed by the American Minister and Admiral Caperton that it was not deemed an opportune time to proceed to the election of a Provisional President until order had been completely restored in the island. On July 7 it was announced that Admiral Caperton had reached an agreement with General Arias for the disarmament of his followers, and on July 26 Federico Henriquez y Carbajal was elected Provisional President by the Dominican Congress. Recognition of the new President and withdrawal of the marines from the Republic were withheld by the United

States pending the complete restoration of order and the negotiation of certain measures which were believed by the United States to be necessary to the stability and progress of the Republic. On Nov. 29 a military government was proclaimed by the commander of the American marines at Santo Domingo to continue until after the elections to be held in January, 1917. It was explained that the native officials would continue to act under supervision of the marine officers and that payments of salaries from the funds collected by the American receivership of customs, which had been withheld, would be resumed. On Dec. 23 it was reported that the diplomatic representative of one of the South American republics had brought to the attention of the State Department, on the previous day, a protest received by his Government from that of the Dominican Republic and directed against the military government established there by the United States.

THE DANISH WEST INDIES

Previous Negotiations and the Treaty of Purchase.—On July 24 it was announced in the press that the American Government had concluded negotiations with Denmark for the acquisition of the Danish West Indies in return for a monetary compensation of $25,000,000 and the relinquishment of American claims by right of discovery in Greenland. The treaty was signed in New York on Aug. 4.

Several previous treaties had been negotiated for the purchase of these islands by the United States, the first being the Seward treaty of October, 1867, which, however, covered only the islands of St. Thomas and St. John, for which $7,500,000 was to be paid. The third island, Santa Cruz, had been acquired by Denmark of the Knights of Malta in 1733, with the stipulation that she would never dispose of it without the consent of France, and this consent it was impossible at that time to obtain. Although the treaty was unanimously approved by both houses of the Danish Parliament and the time within which ratification might take place was twice extended, the Senate took no action thereon. Overtures of the Danish Government for the negotiation of a new treaty in November, 1892, and again in 1896 came to nothing, due to the opposition of the Cleveland administration to the acquisition of the islands.

The decline of the sugar industry, the principal source of wealth of the islands, had placed them in a precarious economic condition, and in January, 1902, the Danish Government agreed to sell the three islands to the United States for $5,000,000, the original sum proposed by Secretary Seward, the French Government having given its consent to the alienation of St. Croix. The treaty passed the Senate but was defeated in the Danish Upper House by a tie vote, due, it is generally believed, to German influence.

The advisability of the acquisition of these islands by the United States, particularly for strategic reasons, is generally recognized. The harbor of Charlotte Amalie, St. Thomas, is one of the finest protected harbors in the West Indies, capable of accommodating any fleet we might desire to send there and admirably suited for a naval base. The chief criticism of the treaty was directed toward the high price in comparison with the amounts fixed in the prior treaties. In accordance with the precedent in the case of the Seward treaty, no plebiscite of the islanders was provided for. The inhabitants of the islands, however, did not delay to express themselves practically unanimously in favor of ratification.

Ratification.—On Sept. 7, in the closing days of the session of Congress, the Senate advised ratification of the treaty without amendment after a debate of somewhat more than two hours. An attempt to reduce the purchase price to $10,000,000 failed. In Denmark the sale of the islands was the subject of a sharp and protracted political controversy (see IV, *Foreign Affairs*).

A plebiscite on Dec. 14, however, resulted in a heavy majority in favor of the sale, and on Dec. 22, after approval by both houses of the Danish Parliament, the treaty was ratified by the King.

PAN-AMERICAN CONFERENCES

Second Pan-American Scientific Conference.—On Dec. 27, 1915, the Second Pan-American Scientific Congress assembled at Washington with more than 1,000 delegates present from the various American republics. A number of recommendations were made by the Congress. In an address to the delegates on Jan. 6, President Wilson spoke of the "fears and suspicions" that had been aroused in Latin America as a result of the Monroe Doctrine, due to the fact that it contained "no promise . . . of what America was going to do with the implied and partial protectorate which she apparently was trying to set up on this side of the water." He then spoke of the closer intercourse between the American republics which was helping to overcome these doubts and fears and of his belief that the foundations of amity would be accomplished

in the first place by the States of America uniting in guaranteeing to each other absolute political independence and territorial integrity. In the second place, and as a necessary corollary to that, guaranteeing the agreement to settle all pending boundary disputes as soon as possible and by amicable process; by agreeing that all disputes among themselves, should they unhappily arise, will be handled by patient, impartial investigation and settled by arbitration; and the agreement necessary to the peace of the Americas, that no State of either continent will permit revolutionary expeditions against another State to be fitted out on its territory, and that they will prohibit the exportation of the munitions of war for the purpose of supplying revolutionists against neighboring Governments.

International High Commission.—Secretary of the Treasury McAdoo attended as a delegate of the United States the first general meeting of the International High Commission on Uniformity of Laws created by the First Pan-American Financial Conference. The meeting was held in Buenos Aires on April 3-12, and the American delegates made the trip on an American war vessel, which stopped at several ports on the east and west coasts of South America *en route* to and from the United States, giving an opportunity for visits and exchange of views with the officials of several of the leading Latin-American countries, of which Secretary McAdoo availed himself.

Among other things the Commission recommended the adoption of a "money of account" of a uniform standard, uniform regulations for commercial travellers, a special conference to consider means of making uniform the maritime laws, and the adoption of conventions for the arbitration of commercial disputes. It was decided that a Pan-American Financial Convention should be held every two years, the next one to take place in 1917 in Washington. (See also IV, *Latin America.*)

INTERNATIONAL RELATIONS OF EUROPE

PORTUGAL

Participation in the War.—On Feb. 23 Portugal seized 38 German and Austrian merchant vessels which had been in Portuguese ports since the outbreak of the war, hauling down the German flag and hoisting in its place the Portuguese standard with the war pennon, which was saluted by the flagship of the Portuguese admiral. This was followed by the seizure of further vessels at St. Vincent, Cape Verde Islands, and at other Portuguese colonial possessions. The Portuguese Premier announced that the Government's action had been necessitated by the urgent need of tonnage and that it was thought to be to the best interest of Portugal that the existing treaty with Germany should be allowed to lapse. The Portuguese Government, he added, was prepared for all eventualities that might arise from the exercise of its rights.

On Feb. 27 Germany protested against this action as a violation of treaty obligations, and on March 9 declared war on Portugal, characterizing the seizure as a climax of a series of breaches of neutrality, among which it instanced the permission of free passage to English troops through Mozambique; the permission given English war vessels to use Portuguese ports for a time exceeding that allowed neutrals; the permission given the English navy to use Madei-

ra as a naval base; and the actual engagements of troops on the frontier of German Southwest Africa and Angola. According to the existing treaty, Germany added, the seizure should have been preceded by an agreement as to the price to be paid the owners of the vessels and was justifiable only in case of public necessity, whereas, it was stated, the tonnage of the ships seized was evidently larger than Portugal's needs. In the latter connection it is interesting to note that a number of the largest vessels were later turned over to Great Britain.

A statement of the Portuguese Minister at Washington of March 13 indicated that the action of Portugal was taken "as a result of her long-standing alliance with England, an alliance that has withstood unbroken the strain of five hundred years." In a statement of March 14 in the House of Commons, on the entry of Portugal into the war, the British Secretary of State for Foreign Affairs admitted that the requisition of German tonnage was urged upon Portugal, which promised "eventually to indemnify the owners of the vessels," by Great Britain. The statement referred also to violations by Germany of Portuguese neutrality by raids in October and December, 1914, into the Portuguese colony of Angola.

ITALY

Declaration of War against Germany.—When the break between Italy and Austria-Hungary became inevitable in 1915 (*A. Y. B.*, 1915, p. 103), the efforts of Prince von Bülow obtained the von Jagow-Bollati treaty of May 21, 1915, providing for the protection of German subjects and their property in Italy and of Italians and their property in Germany. As German investments in Italy have been estimated to amount to $3,000,000,000, the anomalous situation as between the two countries was continued in spite of the proclamation of the Italian Government of Feb. 12, 1916, breaking off trade relations with Germany and the requisitioning by the Italian authorities on Feb. 29 of 34 German ships in Italian ports. On June 8 the Imperial Court of Appeals at Leipsic decided that Germany was actually, if not formally, at war with Italy, and on July 14 it was announced that the Berlin Bankers' Association had circularized all German banks, instructing them that henceforth payments to Italians in Germany should not be made, Italians being treated in this respect as subjects of an enemy state. The action of the Association was stated to have been taken at the request of the German Foreign Office.

On July 15 Italy denounced the von Jagow-Bollati treaty, and on Aug. 27 war was declared against Germany to take effect on Aug. 28. The reasons given by the Italian Government for this action were the military aid lent by Germany to Austria in the latter's operations against Italy, and the treatment of Italian citizens in Germany as hostile aliens by the German banks.

RUMANIA

Participation in the War.—The second addition of the year to the list of belligerents participating in the European struggle came also on Aug. 28, when the Rumanian Government notified its former ally, Austria-Hungary, that from Aug. 27 a state of war existed between the two countries.

The announcement of the declaration of war was accompanied by a statement of the Rumanian Government to the effect that the action was taken in view of the fact that the Rumanian population of Transylvania and Bukowina was exposed to the hazards of war and of invasion; that Rumania believed that by her intervention she could shorten the war; and that in intervening she placed herself upon the side of the powers which she believed could best assist her in realizing her national ideals. In explanation of its apparent failure to live up to treaty obligations with the Central Powers, the Rumanian Government, after adverting to the constant efforts of Rumania to "contribute to the maintenance of peace in the Balkans," stated that since the outbreak of the war she had found herself "in the presence of powers making war with the very object of transforming from top to bottom the old arrangements which had served as a basis for their treaty of alliance,"

and hence "the work of peace which Rumania, faithful to the spirit of the Triple Alliance, had endeavored to accomplish, has been rendered fruitless by those very powers who were called upon to support and defend it." In short, Rumania reserved to herself the right to withdraw from the alliance when she felt that the other parties thereto were no longer working for the purpose which, she stated, impelled her to conclude it, and that independent of any terms fixed in the treaty itself.

It is evident that Rumania entered the war because she believed it to be in the interest of a "Greater Rumania" to do so. She postponed her decision until she felt satisfied as to which side was to emerge victorious and then entered upon that side. With three million or more Rumanians in Austria-Hungary and a million in Russia (Bessarabia), Rumania had an "irredenta" within the boundaries both of the Central Powers and of the Entente, so that she might hope to add to her domains by participation on either side, provided she chose the victor.

Immediately after the outbreak of the war between Austria-Hungary and Serbia, the late King Carol called together a crown council of his ministers and the principal statesmen of the kingdom and announced to them his desire to align Rumania with the Central Powers in the war, as he had pledged himself to do by an Austro-Rumanian secret convention of 1883, entered into by the King but not submitted to the legislature, to which Germany and Italy had subsequently become parties. Von Bethmann-Hollweg, at the opening of the fall session of the Reichstag, stated that King Carol's death in 1914 had been hastened by his inability to redeem the pledge to come to the aid of his brother Hohenzollern, due to the opposition of a majority of the council, including M. Take Jonescu, to participation in the war on the side of the Central Powers. A proclamation of neutrality was issued and, in spite of the repeated declaration of M. Take Jonescu and his followers in favor of participation on the side of the Entente, maintained by the Government under M. Bratiano, who, as the undisputed leader of the principal political party of the country, controlled the legislature, which, as it was elected to bring about certain internal reforms for which the time was deemed inexpedient, enjoyed an indefinite tenure. Italy's declaration of war against Austria-Hungary in 1915 was generally believed to mean that Rumania also would enter the war in the immediate future (*A. Y. B.*, 1915, p. 108), as the Rumanian and Italian Foreign Offices were supposed to be working in close harmony. The close racial kinship of the Rumanian and Italian peoples was cited, as well as the fact that Rumanian culture is largely French. Conversations between Italy and Rumania with a view to simultaneous action had taken place, but they had come to nothing. Rumania and Russia, which had been negotiating as to the extent of Rumanian territorial compensation in the event of her entry on the side of the Allies, had been unable to reach a satisfactory agreement when the Russian retreat from Austria-Hungary and the German-Austrian drive into Russia in 1915 put an end to thoughts of participation on the side of the Allies for the time being. Arrangements entered into between Rumania and Germany and Austria-Hungary in April and May, 1916, for the purchase and shipment of grain to the latter countries by Rumania were pointed to as evidences of a *rapprochement* between Rumania and the Central Powers, but probably they are explainable entirely by Rumania's need of many articles that could be obtained only from the Central Powers in exchange for these shipments. The negotiations with Russia were several times broken off but finally, on Aug. 4, an agreement was drawn up and ratified, by which, Dr. Dillon states, in return for Rumania's participation, her claim "to the countries inhabited by the Rumanians of Austria-Hungary" should be recognized by the Allies provided she "occupied them by force before the close of the war."

GREECE

Allied Occupation of Greek Territory.—It is claimed as one justification of the occupation by the Allies of

Saloniki, in the face of the declaration of neutrality of Greece, that the occupying powers, Great Britain and France, were parties to the treaties of July 6, 1827, and Feb. 3, 1830, and the treaty of 1864, by which Prince William of Denmark was placed upon the throne of Greece with the title of George I, King of the Hellenes, and that the islands of Corfu, Cephalonia, Zante, Santemaura and Cerigo were ceded with the condition that the constitutional *régime* under the guarantee of Great Britain, France and Russia be maintained. This is apparently the construction of Venizelos, although, as Premier, he made formal protest against the landing of troops at Saloniki after having invited the Allies to take this action. The treaty of 1864, which was signed by Great Britain, France and Russia, recited that these powers, "bent on smoothing the difficulties which have arisen in the Kingdom of Greece, placed under their common guarantee," call Prince William to the throne, and that "Greece under the sovereignty of the Prince of Denmark and the guarantee of the three courts forms a monarchical, independent and constitutional state." Armed intervention in Greece certainly was contemplated in the treaties of July 6, 1827, and Feb. 3, 1830, the latter of which states (Article VIII) that "no troops belonging to one of the three contracting parties shall be entitled to enter the territory of the new Greece State without the assent of the two other courts" which signed the treaty. It is argued that the constitutional character of the Kingdom was not maintained when Venizelos was forced out of office although supported by a majority of the Greek Chamber, and when elections were subsequently held while the Army was mobilized in a manner that did not permit a free expression of the wishes of the people. The unwillingness of the Venizelos party to take part in the elections of Dec. 19, 1915, was intended as a protest against the manner of holding the elections (*A. Y. B.*, 1915, p. 153).

On Jan. 11 the French landed a force at Corfu and the Greek Government again entered a vigorous protest. In a statement to the press on Jan. 18, King Constantine drew an analogy between Greece and Belgium, pointing out that the Allies had already occupied Lemnos, Imbros, Mytilene, Castelloriza, Corfu, Saloniki, including the Chalcidice Peninsula, and a large part of Macedonia. "It is no good claiming," the King added, "that the neutrality of Greece was not guaranteed by the Powers now violating it, as was the case in Belgium, for the neutrality of Corfu is guaranteed by Great Britain, France, Russia, Austria, and Prussia. And yet that has not made any difference in their action."

Transportation of Serbian Troops.—In January further pressure upon Greece was attempted by the Allies through a close blockade of Greek ports followed by the landing of forces at Phaleron, five miles southwest of Athens, and in April by the landing of troops in Cephalonia for the creation of a naval base. In April the Allies desired to transport the Serbian Army, which had been recuperating on the Greek island of Corfu, by means of the Greek railroads from Patras to Saloniki, in order to escape the danger from submarines of transportation by water. This Premier Skouloudis repeatedly refused to permit, declaring that if necessary the Greeks would prefer to blow up the railroad bridges and tunnels. Germany and Austria-Hungary protested that compliance by the Greeks with the desires of the Allies in this matter would be regarded as an unfriendly act. After the Second Balkan War, Greece and Serbia had entered into a treaty of Alliance by which they agreed to come to the aid of each other if either power were attacked by Bulgaria. King Constantine interpreted the treaty as relating purely to Balkan affairs and claimed it placed no obligation upon Greece to come to the aid of Serbia when the latter was attacked by non-Balkan powers in addition to Bulgaria. Venizelos opposed this interpretation, for which he stated there was no justification in the treaty, which bound Greece absolutely. On May 15 the British Foreign Office announced that differences between the Entente and the Greek Government has been amicably adjusted.

Bulgarian Invasion and Further Entente Demands.—On May 26 a new situation was created by the entry of Bulgarian troops upon Greek soil in the neighborhood of Demir Hissar and Seres, contrary to assurances stated to have been given to Greece by Bulgaria. Several Greek forts, including that of Rupel, were handed over to the Bulgarians without resistance on the part of the Greek garrisons, acting under orders from Athens. The Fourth Greek Army Corps at Kavala surrendered to the commander of the Bulgarian troops and was subsequently transported to Germany.

On June 8 the Allies again resorted to a commercial blockade of Greece as a "precautionary" restrictive measure, and partial demobilization of the army was agreed to by the Greek Government. This was followed by an Allied note of June 21 (to which Italy was a party, though she was not a signatory of any of the treaties "guaranteeing" the constitutional government of Greece), in which demands were made for the complete demobilization of the Greek Army, the formation of a new ministry of a non-political character, the immediate dissolution of the Chamber, with subsequent elections within the time fixed by law, and the dismissal of certain police officials who were believed to be under German or Austrian influence. These demands were promptly acceded to. Zaimis replaced Skouloudis as Premier and on July 3 the Allied blockade was officially raised.

At the demand of the Allied Governments, Greece agreed, on Sept. 4, to turn over to the Allies the telegraph and postal systems, which the Allies alleged were being misused, and consented to the arrest of Baron von Schenk and other German propagandists in Greece. Zaimis resigned, and Kalageropoulos, his successor, announced that the new Ministry would follow "a benevolent—very benevolent—neutrality toward the Entente." On Sept. 19 it was announced that Greece had demanded of Germany the return of the Greek troops taken at Kavala and "interned" in Germany. In the French *Journal Officiel* of Sept. 20, announcement was made of a blockade of the Greek coast from the mouth of the River Struma to the Bulgarian frontier as a measure against the Bulgarians occupying Kavala. An attitude of coldness, however, was maintained towards the new Cabinet by the Allies, who refrained from replying to the request for suggestions as to what changes in the Cabinet's personnel would meet the Allies' desires.

The Nationalist Revolution.—Meanwhile, revolts against the Government at Athens spread from Macedonia, which was by this time practically governed by the Committee of National Defense, organized at Saloniki by the revolutionary elements, who established what was termed the "Provisional Government of Macedonia." The revolution spread to Epirus, which had been penetrated by Italian troops from Albania, the Ægean Isles, Corfu and Crete. In a public statement under date of Sept. 20, criticizing the policy of the Government at Athens, Venizelos proclaimed his intention to

> wait a brief time yet and see what the Government proposes to do before deciding on the course it will be best to adopt in the event that Greece does not enter the war. . . . As I said on August 27, if the King will not hear the voice of the people, we must ourselves devise what it is best to do. I do not know what that will be, but a long continuation of the present situation would be intolerable. Already we have suffered all the agonies of a disastrous war, while remaining neutral.

On Sept. 25 Venizelos and Admiral Condouriotis, commander of the Greek Navy, left Athens for Crete and there placed themselves at the head of a revolutionary government in Crete.

After receipt of a memorial signed by General Moschopoulos, Chief of Staff of the Greek Army, and five hundred other officers, urging participation by Greece in the war, it was reported on Sept. 26 that the King and his Ministers had informed the Allies of the willingness of Greece to abandon its neutrality if granted a sufficient loan to pay for the mobilization and equipment of the Army. In the event of a declaration of war, the Chamber of Deputies, which is under the control of ex-Premier Gounaris who is reported to have reiterated his opposition to war, would have to be reconvened within the space of five days, and it was feared that war credits might be refused to a war Ministry opposed by the Chamber. On Oct.

4 the Cabinet resigned, alleging its inability to get "into touch with the representatives of the Entente Powers," and a week later (Oct. 10) it was announced that Professor Lambros had succeeded in forming a Cabinet without political color and that Venizelos had publicly indicated the intention of the provisional revolutionary government to adopt war measures against the Bulgars.

Demands of Admiral du Fournet.—On Oct. 11 it was announced that Admiral du Fournet, commander of the Anglo-French fleet in the Mediterranean, had presented an ultimatum to Greece demanding that the latter hand over to the Allies the Greek fleet, except the armored cruiser *Averoff* and the battleships *Lemnos* and *Kolkos*, which three were to be disarmed and to have their crews reduced to one-third of the regular complement. According to reports these three vessels also were taken over by the Allies some days later. Demand was made also for the control of the Piræus-Larissa railroad, as well as the post and telegraph services and all material for naval operations.

It was stated that these demands were "a precautionary measure to insure the safety of the Allies' fleet" and the security of the Allied offensive in the Balkans. The demands were complied with under protest; the fleet was handed over before the prescribed time and the work of reducing the forts along the Greek coast was taken over by Allied soldiers. Several days later came reports that the Greek Government had accepted demands of Admiral du Fournet for the control of the Greek police, the prohibition of Greek citizens from carrying arms, the stoppage of shipments of munitions of war to Thessaly, and the lifting of the embargo on the transportation of Thessalian wheat. It was reported that these two notes of the French Admiral were due to a supposed Greek royalist plot to withdraw with the troops to Thessaly and there to await the arrival of the German Army, with which they hoped to coöperate against the Entente Allies. Greek officers stated that the war materials shipped to Thessaly were intended for those soldiers of the Fourth Army Corps who had not been taken to Germany, their equipment having fallen into the hands of the Bulgarians. It was announced on Oct. 13 that the French had taken over the control of Piræus, the seaport of Athens, and that all shipping manifests from that port would require the *visé* of the Allies to be valid.

Announcement was made on Oct. 15 that Premier Lambos had officially renewed the recent proposals of former Premier Kalogeropoulous to the Entente for Greece's entrance into the war. Previous dispatches from Greece had indicated that the main desire of the Greek Government before taking final action was a definite guarantee from each of the principal Allied powers of the integrity of the Greek kingdom. On Oct. 16 it was announced that the Allies had formally recognized the provisional government set up by ex-Premier Venizelos in Crete.

On Oct. 16, following a review of the soldiers and marines from the Greek vessels taken over by the Allies, the railway station and other buildings in Athens were occupied by French and Italian marines in anticipation of "Entente" demonstrations. On the following day a band of Greek citizens, carrying Greek and American flags, cheered the American Legation and later presented a petition to the American Minister asking the sympathy and protection of the United States against the encroachments of the Entente.

It was announced on Oct. 19 that the Greek Government had accepted the demand of the Entente that one of the officers of the Allied forces be given authority over the Greek police. On the same day arrests made by French marines, who resorted to a bayonet charge to disperse demonstrators, were reported. It was stated also that King Constantine had given his personal pledge that the Government intended no hostile move against the Allies and, as proof of his good faith, promised to withdraw the Greek troops from Larissa in the rear of the Allies' lines. Allied demands for the reduction of the Greek Army to a peace footing and the evacuation of Thessaly by Greek soldiers were re-

ported on Oct. 21, on which date, it was announced, a French censorship of all Greek newspapers would be established. On Oct. 29 the Greek Government announced that King Constantine had spontaneously undertaken to dispel the suspicions of the Entente by the removal of Greek troops in Thessaly and Epirus to the Peloponnesus, which action he had previously refused to take at the demand of the French military attaché. As a result of revolutionary attacks upon the Greek troops at Katerina, the latter withdrew into Thessaly, and on Nov. 5 it was announced that the withdrawal of Greek troops from Thessaly had been postponed pending the establishment of a neutral zone. On Oct. 27 it had been announced that the Greek Government and the representatives of the Entente powers had come to an understanding, among other things, not to oppose recruiting for the movement headed by Venizelos, which was now characterized as "anti-Bulgarian."

It was announced on Nov. 4 that the Greek Government had rejected as inacceptable, because it would constitute a departure from neutrality, a demand of Admiral du Fournet for consent to the use of a Greek light flotilla carrying the French flag and a French crew as a protection against submarines. A report that the Greek Government had consented to allow the officers of the Greek Army to join the provisional government coöperating with the Allies, provided they first resigned from the royal service, was followed on Nov. 17 by a dispatch to the effect that the French Minister of War, who was then in Greece, had informed the Greek Government that General Sarrail, the commander of the Allied forces, had sent troops to maintain a neutral zone along the frontier of old Greece. On Nov. 24 it was reported that the royalist troops had refused to evacuate Katerina, apparently situated in the so-called neutral zone, as had been demanded by the Entente, and that General Sarrail had warned the Greek Government that unless an order for the immediate evacuation of the town was given he would resort to force.

On Nov. 20 it was announced that Vice-Admiral du Fournet had notified the German, Austro-Hungarian, Bulgarian and Turkish Ministers at Athens to depart from Greece before Nov. 22. It was later reported that Ministers of the Central Powers left Greece within the time specified after having notified King Constantine that they did not hold the Greek Government responsible for the action of Admiral du Fournet nor regard it as a hostile act on the part of Greece. It was also announced on Nov. 20 that Admiral du Fournet had presented a note to the Greek Government demanding that all arms, munitions and artillery of the Greek Army, except some 50,000 rifles, be turned over to the Entente. A dispatch of Nov. 23 stated that the Greek Government had refused to comply with this demand, as to turn over these munitions of war to the Entente, even for a consideration, would amount to a breach of neutrality on the part of Greece, which, besides, would be unable to protect her vital interests. A later dispatch stated that the French Admiral had replied, brushing aside the objections of the Greek Government and placing a short time limit within which it was required that the arms and munitions be handed over to the Allies, who stated that they desired these arms as "compensation" for those surrendered to the Bulgarians in eastern Macedonia.

On Nov. 25 it was announced that the provisional government of Venizelos had formally declared war on Bulgaria. It was reported also that the Venizelos government had declared war against Germany in retaliation for the latter's action in torpedoing vessels carrying forces and partisans of the provisional government.

On Nov. 30 it was stated that the Entente was ready to begin debarkation of troops at the Piræus and that the Greek Government had again assumed control of the post offices and telegraphs at Athens, expelling the French officers who had been exercising control. The Greek Crown Council having supported the Government's decision not to surrender the arms demanded by Admiral du Fournet, the latter was quoted as stating he would land detachments of Allied

troops at all necessary points if the arms were not surrendered within the time limit fixed, which was to expire on Dec. 1.

Just before the expiration of the time limit, a definite refusal was communicated by the Greek Government to Admiral du Fournet. As a result French marines were landed at the Piræus and advanced upon Athens, and fighting occurred in Athens, particularly in the neighborhood of the royal palace, between French marines and Greek troops and between Venizelos adherents and Greek reservists. Some hours later an armistice was arranged by which Admiral du Fournet agreed to withdraw all except 300 marines left as a guard, upon the surrender to the Entente of six batteries of artillery.

The Blockade.—On Dec. 8 the *Journal Officiel* of Paris published a decree proclaiming a blockade of the Greek coast and islands under the control of the royal Government and an explanation was demanded by the ministers of the Entente Powers, of the Government of King Constantine, of movements of Greek troops, to which the Greek Government replied that these movements had ceased. Representations were reported by the American, Dutch and Spanish ministers in behalf of Venizelist adherents taken prisoner during the disorders on Dec. 1 and 2, and on Dec. 9 it was reported that the Entente had sent a peremptory note demanding the immediate release of all followers of Venizelos who had been taken prisoner. On Dec. 12 it was announced that the Greek chargé at Paris had gone to the Foreign Office for the purpose of expressing in the name of the King and the Government at Athens sincere regret at the recent deplorable disturbances. On Dec. 15 it was announced that the Greek Government had accepted an ultimatum of the Entente, the exact character of which was not stated, but which evidently referred, in part, at least, to the movement of troops and war materials, and had further offered to arbitrate the question of the alleged attack upon the French troops in Athens on Dec. 1. The hope was expressed that in view of these assurances the Entente might see fit to lift the blockade. On Dec. 18 the Greek Government sent a note to the Entente protesting against the aid sent the Venizelist adherents in their operations against the constituted authorities at Syra and other islands, which could not be reached by the royalist forces due to the blockade.

At the close of the year it was understood that the Greek Government was proceeding with the demobilization of the Greek army and the transportation to the south of the troops in Thessaly, in accordance with the Entente demands. A further note of the Entente was reported, demanding the reëstablishment of the Allied control of telegraphs, posts, railways and police, the prohibition of the meetings of reservists north of the isthmus of Corinth and a prohibition on the carrying of arms by civilians, the immediate release of all persons detained for high treason or other political offenses, and apologies to the Entente ministers and salutes to their flags in some public place in Athens. Reports at the end of the year indicated that the Greek Government was willing to go a considerable way to meet the Entente demands, but was unwilling to comply with certain of them, such as the immediate release of imprisoned Venizelist adherents deemed guilty of treason. Meanwhile the blockade which cut off Greece from supplies from the outside world remained in force, and on Jan. 1, 1917, it was officially announced that the British Government had appointed a diplomatic agent to the provisional government of Venizelos.

POLAND

Proclamation of a Polish Kingdom.—In August, 1914, at the very outbreak of the war, the Grand Duke Nicholas, in command of the Russian Army, by proclamation promised autonomy to Poland. The proclamation was not followed by an imperial *ukase*, however, and no steps were taken to put the promise into effect. On Nov. 5, 1916, proclamations of the German and Austrian Emperors were read at Warsaw and Lublin indicating their purpose to create a Kingdom of Poland out of the terri-

tory conquered from Russia and occupied by them which formerly formed part of the Kingdom of Poland. Details as to the administration of the new kingdom were not announced, but the proclamation stated that the Central Powers "have agreed to form of these districts a national state with a hereditary monarchy and a constitutional government," and that "the new kingdom will receive the guarantees needed for the free development of its own forces by its intimate relations with both powers" (Germany and Austria-Hungary). The exact frontiers of the new kingdom were left for future demarcation. It was announced that a regent would be appointed to administer the kingdom temporarily, pending its organization and the selection of a king. It was later reported that the Austrian Archduke Charles Stephen had been appointed regent.

Although no part of the territory inhabited by Poles which formed part of Germany or Austria-Hungary before the outbreak of the war was included in the new kingdom, the following quotation from a letter of Emperor Francis Joseph to the Austrian Premier is significant:

> It is therefore my will, at the moment when the new state comes into existence, to grant in connection with this evolution the right to the land of Galicia to settle public affairs autonomously so far as is consistent with the fact that Galicia forms part of our commonwealth and so far as is consistent with the welfare of that land; and thus to offer to the population of Galicia a guarantee of national and economic development.
>
> In notifying you of my purpose in this connection I request you to elaborate projects suitable for its legal realization and to place them before me.

It is understood that no recognition of the new kingdom by neutral powers would be asked during the continuance of the war.

TURKEY

Denunciation of Treaties of Paris and Berlin.—Following the action of Turkey on Aug. 11, 1914, in declaring abrogated the "capitulations" which gave foreigners in Turkey the right to be tried by judicial, diplomatic or consular officers of their own nations, and on Sept. 10, 1914, in denouncing the remaining conventions and treaties exempting foreigners in that country from the local jurisdiction, came a note of the Sublime Porte addressed about Oct. 1, 1916, to the Governments of Germany and Austria-Hungary, denouncing the Treaties of Paris and Berlin and rescinding the laws of 1861 and 1864 granting an autonomous administration under a Christian governor to the Liva of Lebanon.

To the Treaty of Paris of March 30, 1856, terminating the war between Great Britain, France, Sardinia and Turkey on one side and Russia on the other, and to the Treaty of Berlin of July 13, 1878, which followed the Russian war against Turkey for the liberation of the Christian Balkan states, were due in the main the status in the Balkans and the Near East up to the outbreak of the present war. All the principal European powers were signatories of both treaties, which together provided for the question of the passage of the Dardanelles and Bosphorus, the navigation of the Danube, and the "neutralization" of the Black Sea, and fixed the status of Serbia, Montenegro, Rumania, Bulgaria (before it declared its independence of Turkey), Crete, and Bosnia and Herzegovina (before the Austrian annexation).

Article VII of the Treaty of Paris reads as follows:

> Leurs Majestés (Great Britain, Prussia, Russia, France, Austria and Sardinia) s'engagent, chacune de son côté, à respecter l'indépendance et l'intégrité territoriale de l'Empire Ottoman: garantissent en commun la stricte observation de cet engagement: et considéreront, en conséquence, toute acte de nature à y porter atteinte comme une question d'intérêt général.

Article IX of the same Treaty provides:

> Il est bien entendu qu'elle ne saurait, en aucun cas, donner le droit aux dites Puissances de s'immiscer, soit collectivement, soit séparément, dans les rapports de sa Majesté le Sultan avec ses sujets, ni dans l'administration intérieure de son empire.

Russian support of Serbia and Montenegrin efforts to throw off the Turkish yoke, the French protectorate of Tunis, British encroachments in Egypt, Koweit and elsewhere and the Italian war ending in the annex-

ation of Tripoli are cited by Turkey in her note as violations of these stipulations, and the fortification of Batum is cited as a violation by Russia of Article LIX of the Treaty of Berlin, which declared Batum a free port.

Arguing that the provisions of the treaties to her disadvantage cannot be enforced while those in her favor have been repeatedly violated and that the whole situation has changed, due to the fact that she is now at war with some of the signatory powers and allied "on a footing of entire equality" with others, Turkey notifies her allies of the denunciation of the two treaties and her definite abandonment of her "somewhat subordinate position under the collective guardianship of the Great Powers," adding that in spite of the denunciations she "will not fail to appeal to the principles of international law in order to have those rights respected which have been stipulated" in her favor by the above mentioned treaties.

Although the special status of the Liva of Lebanon was created by Turkish statutes, Turkey states in the note that these were the result of "pressure from France." The region in question is inhabited principally by Marionite Christians and the Druses, an unorthodox sect of Mohammedans.

PEACE PROPOSALS

Overtures of Central Powers.—On Dec. 12 the Governments of Germany and her allies addressed notes to the diplomatic representatives of the various neutral nations charged with belligerent interests at their capitals, expressing the belief of the Central Powers in their ability to continue to resist successfully the superior resources and forces arrayed against them, but indicating their willingness to enter upon peace negotiations. It was requested that the note be transmitted through the diplomatic representatives to whom it was delivered to the belligerent Governments with whose interests they were charged.

No intimation was contained in the note as to the terms upon which the Central Powers would agree to peace with the Entente, but simultaneously with the announcement of the move for peace the German Ambassador at Washington was reported as intimating that the substance of the proposals would be the surrender of Belgium and French occupied territory, the recognition of Poland and Lithuania as independent states, the return of the German colonies that had been taken during the war, the annexation of a large part of Serbia to Austria-Hungary, and the settlement of the situation in the Balkans by a general European conference. It was also intimated that Germany would propose partial disarmament. No mediation on the part of the neutral nations transmitting the note was asked and the American Government forwarded it without comment.

President Wilson's Note.—On Dec. 18 substantially identic notes were telegraphed by direction of the President to the American diplomatic representatives at each of the belligerent capitals for immediate presentation suggesting

> that an early occasion be sought to call out from all the nations now at war such an avowal of their respective views as to the terms upon which the war might be concluded and the arrangements which would be deemed satisfactory as a guaranty against its renewal or the kindling of any similar conflict in the future, as would make it possible frankly to compare them.

The President pointed out "that the objects which the statesmen of the belligerents on both sides have in mind in this war are virtually the same, as stated in general terms to their own people and to the world," and that "in the measures to be taken to secure the future peace of the world the people and Government of the United States are as vitally and as directly interested as the Governments now at war." "It may be that peace is nearer than we know," argued the note, since "the concrete objects for which it is being waged have never been definitely stated," and "stated in general terms, they seem the same on both sides."

The suggestion was made

> in the most friendly spirit and as coming not only from a friend but also as coming from the representative of a neutral nation whose interests have been most seriously affected by the war and whose concern for its early conclusion arises out of a manifest necessity to de-

termine how best to safeguard those interests if the war is to continue.

The President warned against a war to exhaustion, "lest the situation of neutral nations, now exceedingly hard to endure, be rendered altogether intolerable, and lest, more than all, an injury be done civilization itself which can never be atoned for or repaired," and hope of a peace on a permanent basis even after the war is over be lost forever. Care was taken to point out that the President "has long had it in mind to offer" this suggestion, which was in its origin "in no way associated" with the "recent overtures of the Central Powers." Finally, it was stated that "the President is not proposing peace; he is not even offering mediation. He is merely proposing that soundings be taken in order that we may learn, the neutral nations with the belligerent, how near the haven of peace may be, for which all mankind longs with an intense and increasing longing."

The publication of the note on Dec. 21 was closely followed by a statement of Secretary Lansing, reading partly as follows:

The reasons for the sending of the note were as follows:

It is not our material interest we had in mind when the note was sent, but more and more our own rights are becoming involved by the belligerents on both sides, so that the situation is becoming increasingly critical.

I mean by that that we are drawing nearer the verge of war ourselves and, therefore, we are entitled to know exactly what each belligerent seeks in order that we may regulate our conduct in the future.

As this created the impression that the President had taken the step because the country was in fact about to be drawn into the war, Secretary Lansing made a second statement, intended to correct this impression, in which he said:

My intention was to suggest the very direct and necessary interest which this country as one of the neutral nations has in the possible terms which the belligerents may have in mind, and I did not intend to intimate that the Government was considering any change in its policy of neutrality which it has consistently pursued in the face of constantly increasing difficulties.

Attitude of Other Neutrals.—Copies of the note were sent to neutral Governments for their information and the Swiss and Scandinavian Governments sent notes to the belligerents indicating their interest in and support of the suggestion of the President of the United States. Greece, also, in a note that was largely given over to a statement of her particular difficulties, expressed her appreciation to the United States of the American proposals and her hope for their success. Spain, on the other hand, indicated that it believed the time was not opportune and President Wilson's efforts were likely to be inefficacious. The Spanish Government expressed its deep interest in every effort toward peace but declared its intention to suspend action until such time as seemed more auspicious.

Reply of the Central Powers.—On Dec. 26 Germany, Austria-Hungary, Bulgaria and Turkey replied in the following terms to the President's suggestion:

The Imperial Government has accepted and considered in the friendly spirit which is apparent in the communication of the President, the noble initiative of the President looking to the creation of bases for the foundation of a lasting peace. The President discloses the aim which lies next to his heart and leaves the choice of the way open. A direct exchange of views appears to the Imperial Government as the most suitable way of arriving at the desired result. The Imperial Government has the honor, therefore, in the sense of its declaration of the 12th instant, which offered the hand for peace negotiations, to propose the speedy assembly, on neutral ground, of delegates of the warring States.

No proposed peace terms were indicated.

The Entente Reply to German Proposals.—As early as Dec. 15 the Russian Duma voted to reject the German peace proposals and on Dec. 18 Premier Briand in the French Chamber of Deputies advised against their acceptance. Lloyd George, the newly designated British Premier, in a speech in the House of Commons on Dec. 19, insisted that peace was not possible without "complete restoration and full reparation with effective guarantees for the future," and counseled against the acceptance of the German peace proposal which did not indicate the terms which Germany was willing to offer.

After consultation between the Allies a joint note was dispatched on Dec. 30 by the Entente Governments, rejecting the German offer as a "sham proposal" and "war manœuvre," based on the present "war map," which did not represent the "real strength of the belligerents," and sent for the purpose of creating "dissension in public opinion in the allied countries," "stiffening public opinion in Germany and the countries allied to her," and deceiving and intimidating public opinion in neutral countries. A considerable portion of the note was given over to a review of the events leading up to the war and the note closed with a further statement at some length of the situation in Belgium. "A mere suggestion, without a statement of terms, that negotiations should be opened, is not an offer of peace," said the note, and the Entente position was set forth in the following paragraphs:

Fully conscious of the gravity of the moment but equally conscious of its requirements, the Allied Governments, closely united to one another and in perfect sympathy with their peoples, refuse to consider a proposal which is empty and insincere.

Once again the Allies declare that no peace is possible so long as they have not secured reparation for violated rights and liberties, the recognition of the principle of nationalities and of the free existence of small states; so long as they have not brought about a settlement calculated to end once and for all forces which have constituted a perpetual menace to the nations, and to afford the only effective guarantee for the future security of the world.

It was understood at the close of the year that the Entente reply to President Wilson's suggestion was being framed and would soon be dispatched.

INTERNATIONAL RELATIONS IN THE FAR EAST

RUSSIA AND JAPAN

The Russo-Japanese Treaty.—Following frequent reports of a projected alliance between Japan and Russia, the semi-official papers of Japan announced on July 8 that a treaty had been signed on July 3 by the Russian Minister of Foreign Affairs and the Japanese Ambassador at Petrograd. The text of the treaty was stated to be as follows:

The Imperial Government of Japan and the Imperial Government of Russia, having resolved by united efforts to maintain permanent peace in the Far East, have agreed to the following:

Art. 1: Japan will not be a party to any arrangement or political combination directed against Russia. Russia will not be a party to any arrangement or political combination directed against Japan.

Art. 2: In case the territorial rights or special interests in the Far East of one of the contracting parties recognized by the other contracting party are menaced, Russia and Japan will act in concert on the measures to be taken in view of the support or coöperation necessary for the protection and the defense of these rights and interests.

According to dispatches from Tokyo, Japan has assured the United States that the treaty will not in any way affect the *status quo* in the Far East.

This treaty, the importance of which can hardly be over-estimated, is the culmination of the *rapprochement* between Japan and Russia which began not long after the close of the Russo-Japanese war, and particularly after Secretary Knox's proposal in 1909 for the neutralization of the Manchurian railways. This was followed by the Russo-Japanese treaty of July 4, 1910, the avowed object of which was the maintenance of the *status quo* in Manchuria, to which end the two powers agreed to confer on methods to be taken with a view to mutual coöperation. Each country has recognized the advantage of being able to concentrate its energy and resources upon the development of its own territory and sphere of influence without danger of hostility from the other, and of a community of interest and solidarity in the face of developments in the Far East. This *rapprochement* has been hastened by the important coöperation of Japan in the form of contributions of munitions of war to Russia during the European War.

The treaty as given above, providing for permanent friendship and "support and coöperation" where necessary between the two powers in the face of any menace to their respective interests in the Far East, is generally believed to be supplemented by cer-

tain secret agreements negotiated by special Japanese commissioners to Petrograd. It has been stated that the following principles have been tentatively agreed upon:

(1) Russia to grant Japan the control of the Eastern Chinese Railway from Changshun to the Sungari River. It will be remembered that Japan strongly pressed for the cession of Russia's rights in the whole of the Eastern Chinese Railway as far as Harbin at the time of the negotiation of the Portsmouth Treaty, but finally agreed to Changshun as the terminus of her section, the rest of the 140 miles to Harbin through the rich agricultural section of Manchuria remaining under Russian control. Russia now agrees to extend the section under Japanese control to the Sungari River (about half way between Harbin and Changshun) at a price tentatively fixed, according to this statement, at $7,000,000.

(2) Russia with the consent of China grants Japan the privilege of navigating the second Sungari River. Although this river is in the Japanese sphere of influence, Japan has been prevented from navigating it, the exclusive right to do so having been granted Russia by the Aigun Treaty of 1858.

(3) Freedom of trade, residence and travel in Siberia, Mongolia and Manchuria will be enjoyed equally by Japanese and Russians.

(4) Japan will continue to furnish munitions of war to Russia when to do so does not interfere with her own plans of defense.

JAPAN AND CHINA

The Cheng Chiatun Incident.—As a consequence of a conflict between Chinese and Japanese troops at Cheng Chiatun, in which about 17 Japanese and a larger number of Chinese soldiers were killed as a result of the refusal of the Japanese troops to turn over to Chinese officials a Japanese who had been arrested by the Chinese authorities in the enforcement of certain laws directed against banditry, it was announced in the press on Sept. 4 that Japan had demanded of China the right to police Eastern Inner Mongolia, a region in which Japan had in 1915 indicated her special interest. It will be recalled that a number of special concessions in Eastern Inner Mongolia were included, coupled with a statement that "the Chinese Government has always acknowledged the special position enjoyed by Japan in Eastern Inner Mongolia" in group 2 of the demands made upon China on Jan. 18, 1915 (*A. Y. B.*, 1915, page 111). On Sept. 6 the press reported certain further secret demands upon China, including (1) the consent of China to the employment of Japanese military advisers for the Chinese army in Southern Manchuria and Eastern Mongolia and of Japanese military instructors in Chinese schools and colleges; (2) a formal apology in person to be made by the Chinese governor at Mukden to the Japanese governor of Dairien and the Japanese consul at Mukden; and (3) recognition of the special interests of Japan in Inner Mongolia.

American Diplomatic Inquiries.—Secretary Lansing instructed the American Ambassador at Tokyo to call the attention of the Foreign Office to the newspaper reports of these demands, to ask for a statement of the facts, and to inform the Foreign Office that the report of the demands had greatly disturbed the American Government, which trusted that the reports were untrue. On Sept. 12 Ambassador Guthrie cabled the Department of State that the Foreign Office had informed him that

> the clash at Cheng Chiatun, being between military forces, was of a serious character, and therefore in order to prevent a recurrence of such trouble, Japan was requesting, in addition to proper apologies and monetary compensation, that Japanese officers should be appointed as instructors in the Cadet School (probably at Mukden), and suggesting that the Chinese Government should ask for the appointment of Japanese advisers to be stationed with Chinese garrisons in South Manchuria and East Mongolia, and that as an extension of its extra-territorial rights, the Japanese Government should be permitted to station Japanese policemen in towns where there are large Japanese settlements.

The Japanese Government denied that the demands infringed on Chinese sovereignty or the principle of the open door in China or impaired the Root-Takahira agreement, in which Japan and the United States pledged

themselves to support the integrity of China and agreed to keep each other informed as to any steps which might change the *status quo*.

The military importance to Japan of Japanese military advisers to be stationed with the Chinese garrisons in South Manchuria and East Mongolia and at the Cadet School, as well as of Japanese police in towns "where there are large Japanese settlements," is evident. To understand fully the purport of these demands, which have been very generally commented upon as excessive, they should be considered in connection with the demands upon China of the year 1915 resulting in the treaty of May 25, 1915 (*A. Y. B.*, 1915, pp. 109-15). The presence of Japanese troops in Cheng Chiatun has been the subject of comment, as that town is a considerable distance from the nearest point on the South Manchurian Railway, and Japan's right to station troops in Manchuria is for the protection of the railroad and is limited to the railway zone. Chaoyangpa, where a second conflict between Chinese and Japanese troops occurred as the latter, according to dispatches of Sept. 5 from Tokyo, were advancing to mediate between Chinese and Mongolians, is even further removed than Cheng Chiatun from the railway line. It has been the custom for foreign Governments to station troops in the international settlements, and provision is made for the opening of international settlements in this region in the 1915 treaty between Japan and China. No notice, however, has been received by the Government of the United States of the opening of either Cheng Chiatun or Chaoyangpa as an international settlement.

Protests Against American Loans and Concessions.—In order to obtain a comprehensive loan for internal development and the carrying out of the reforms that were contemplated by the Government, China turned to the United States and through the State Department endeavored to negotiate with American bankers for a loan of $5,000,000, to be in the nature of the first installment of a $30,000,000 loan. China's efforts, however, were at first unsuccessful, due to the attitude of the American bankers that they were still bound by the terms of the agreement entered into by the sextuple group for equal participation in loans to China, which did not expire till 1917 (*A. Y. B.*, 1912, p. 94; 1913, p. 87). The situation was further complicated by the fact that the bankers of the Entente were naturally unwilling to coöperate with German bankers and that all the belligerent Governments of Europe needed all funds available at this time for the prosecution of the war. Suggestions from Japan that she would undertake to arrange for a loan to China did not meet with very much favor in the latter country although negotiations were entered into.

The Chinese Government, however, finally succeeded in arranging for a loan of $5,000,000 from the Continental and Commercial Bank of Chicago, and the loan was approved by the Chinese Parliament practically unanimously. On Nov. 23 it was announced that the British, French, Russian and Japanese bankers of the sextuple group had sent a letter to the Chinese Minister of Finance, stating that the loan was a violation of Article 17 of the reorganization loan agreement of April 26, 1913, as the loan was of a political character. The Chinese Legation is reported to have stated, with reference to these letters of protest, that the loan was in fact of an industrial and not of a political character, and that Article 17 of the agreement referred to could have no applicability to the new loan as it referred only to the salt tax, whereas the new loan was secured by the wine and tobacco tax. Objection to the Chicago loan was later withdrawn and American coöperation in an extensive reorganization loan to China requested by the representatives who had protested.

Following the announcement that the American International Corporation had agreed to a loan of $60,000,000 to be used for the construction of 1,500 miles of railroad through the richest section of China by an American company, came the report on Oct. 14 that both Japan and Russia had entered protests against certain features of the arrangement as planned. The Russian

protest objected to the proposed railroad from Feng-cheng, Shansi Province, to Lanchow-fu, Kansu Province, stating that the Chinese Minister in Petrograd 18 years ago orally promised that Russia should have the privilege of building railways in the vicinity of Mongolia. Reference, according to report, was made also to a note sent at the same time by the Chinese Foreign Office to the Russian Minister at Peking, promising Russia preferential treatment in case it was decided to construct railways "from Peking to the North or Northeast toward the border" by foreign capital. It was stated that in his acknowledgment of this note the Russian Minister interpolated the words "or any other direction," and the claim was made that the failure of the Chinese Government to protest against this construction indicated an acquiescence therein. Under the contract of the Chinese Government with the American firm, the latter is to have the right of construction of an equal mileage of railroad elsewhere if the protest of the Japanese and Russian Governments proves effective.

The Japanese protest was directed against the Chinese agreement with the same American Company for the construction of the northern half of the Grand Canal. Objection was taken to the reconstruction of 200 miles within the province of Shangtung, in which province Japan claims to have succeeded to all the rights of Germany, which included preferential treatment for German capitalists in all schemes for the development of Shantung Province.

INTERNATIONAL PEACE AND ARBITRATION

JAMES L. TRYON

A Minimum Programme for Durable Peace.—There has been during the year wide discussion of plans for permanent peace to take effect after the European War. This has been concentrated especially upon the question of sanctions, opinions differing as to whether public opinion and enlightened self-interest are sufficient or whether an agreement to use economic pressure or military compulsion or both may also be necessary to secure the enforcement of international law. Economic causes of war also are receiving more consideration than formerly. Most active in Europe, the Central Organization for a Durable Peace, formed at The Hague in April, 1915, by an unofficial group of jurists and publicists of belligerent and neutral countries, has established headquarters at Theresiastraat 51, The Hague, with Dr. B. de Jong van Beek en Donk as its general secretary. It has set committees to work in various nations, including the United States, preparing studies of problems relating to the war and final peace. Several of its studies, as well as answers to a questionnaire issued by it, have been published. This organization in its "minimum programme" opposes the annexation or transfer of territory contrary to the interests and wishes of populations concerned, and recommends getting their consent by plebiscite when possible. It proposes to guarantee to all nationalities within the boundary of a state equality before the law, religious liberty, and the free use of native languages; favors equal commercial treatment for all nations in colonies, protectorates and spheres of influence; and advocates the development of the Hague conference system with states pledged to resort to a court or council of conciliation for the settlement of international disputes before resorting to war, noncompliance to be followed by the concerted diplomatic, economic and military action of the other nations. Further recommendations are the reduction of naval armaments; the abolition of the right to capture merchant ships, thus securing freedom of the seas; the effective control of foreign policy by parliaments, and the principle that secret treaties shall be void. This programme was discussed and made the basis for further study by a conference of American peace workers held in New York on Oct. 26-27, when a committee was appointed to prepare the way for a large conference of peace societies to be held in this country probably during 1917.

Work of Peace Organizations.—More than 2,000 delegates met in Washington on May 26-27 at the first annual meeting of the League to Enforce Peace, when the details of its platform were explained and defended by able speakers and a large sum of money was subscribed for the field and editorial work which is proceeding on an extensive scale from national headquarters, 70 Fifth Avenue, New York City. In response to a referendum, leading business organizations allied with the Chamber of Commerce of the United States, as well as a majority of members of the National Economic League, have endorsed either the platform of the league or substantially the same principles that it maintains, preference sometimes being expressed for the use of economic pressure before military force is applied in the coercion of a state. Believing that the programme of the League to Enforce Peace embodies reforms most likely to be realized after the war, the World Peace Foundation (Edward Cummings, secretary, 40 Mt. Vernon Street, Boston), in addition to its usual activities has assisted that organization by grants of money, assignment of staff workers, provision for office headquarters, and the distribution of publications. It has also organized and contributed to the expenses of a student conference on international relations held at the Western Reserve University, Cleveland, June 21-July 1.

On May 13 the American Peace Society was reorganized by the adoption of a new constitution for the purpose of securing better coöperation among the various peace associations and agencies of the United States. Membership hereafter will be through divisional, usually state, societies, which will be represented by delegates on the national board of directors. Affiliated organizations number 75. The *Advocate of Peace*, enriched by contributed articles, has a circulation of about 9,500 copies. During the year ending in May, 1916, the national society had distributed 55 different kinds of pamphlets and its speakers had made 900 addresses. This society, first organized in 1828, favors a programme in harmony with the plan of its founder, William Ladd, who proposed that the nations be organized with a court and a congress on a coöperative basis without international military force as a sanction. The year has been marked by the death of Dr. Benjamin F. Trueblood, honorary secretary. Headquarters of the society are 616 Colorado Building, Washington, D. C.; president, George W. Kirchwey; secretary, Arthur Deerin Call.

The twenty-second Lake Mohonk Conference on International Arbitration, May 17-19, discussed the question of sanctions as well as neutrality and preparedness. Hon. William H. Taft presided. Hon. William J. Bryan, Hon. Theodore Marburg, Prof. Eugene Wambaugh, Rear-Adm. Austin M. Knight and Prof. William I. Hull were among the principal speakers on new or debated topics. The conference as a whole, without committing itself on the question of sanctions, reaffirmed its belief in the efficacy of the Permanent Court of Arbitration at The Hague with its record of decided cases, and once more urged the importance of placing the protection of foreigners under Federal jurisdiction. The World's Court League, incorporated Dec. 28, 1915, has been reorganized for a widely extended campaign of popular education in behalf of a permanent court of international justice, together with a court of arbitration and a council of conciliation, periodic Hague conferences, and a permanent continuation committee with delegated administrative powers, no coercion being proposed. It publishes the *World Court*, a magazine of which Frank C. Bray is editor. The president is John Hays Hammond, the general secretary, Prof. Samuel T. Dutton, and the executive secretary, Charles H. Burr; headquarters in the Equitable Building, New York City. This league held a congress in Carnegie Hall, May 2-4. The American Society for Judicial Settlement of International Disputes (Hon. Theodore Marburg, Baltimore, president) discussed at Washington, Dec. 9-10, the functions, procedure and sanctions of the Supreme Court of the United States. The Society to Eliminate Economic Causes of War (Roger Babson, secretary, Wellesley Hills, Mass.)

held its annual conference in Boston, Jan. 8-10. It sends out monthly bulletins showing the relation of tariffs, immigration restrictions and the struggle for the control of the sea to international discord. These publications denote a new emphasis on economic pacifist investigation into the problems of peace and war.

The Fellowship of Reconciliation, with strong religious and ethical purposes, has been organized with Edward W. Evans, secretary, 1405 Real Estate Trust Building, Philadelphia. It has held conferences at Garden City and Ocean Grove. The American Council of the World Alliance for Promoting International Friendship through the Churches was permanently organized with William P. Merrill as president, Rev. Frederick Lynch and Rev. Sidney L. Gulick as secretaries. Its office is at 105 East 22d Street, New York City. It held a conference at Garden City, Long Island, April 25-27. It proposes to hold a convention of Christian bodies at the close of the war in the place where the treaty of peace is to be negotiated. The American Council of the World Alliance, in coöperation with the Commission on Peace and Arbitration of the Federal Council of the Churches of Christ in America, invites every congregation to establish peace-makers' committees for the purpose of educating all Christian citizens in international ethics. Heartily coöperating with the peace movement, the Church Peace Union (Dr. Frederick Lynch, secretary, 70 Fifth Avenue, New York City) has made possible by its liberal financial aid the holding of several important conferences during the year.

The Woman's Peace Party held its annual meeting in Washington, Dec. 8-10. It has societies or affiliated associations in more than 30 states and in some sections of the country has been prominent in peace agitation. The president is Jane Addams; secretary, Mrs. Lucia Ames Mead; headquarters, 116 South Michigan Avenue, Chicago. The annual meeting of the American School Peace League (Mrs. Fannie Fern Andrews, secretary, 405 Marlborough Street, Boston) was held in connection with the National Education Association in July. The American Union against Militarism, formerly the League to Limit Armaments, has been active in its opposition to military preparedness. The headquarters are at Munsey Building, Washington, D. C.; the executive director is Crystal Eastman.

The Henry Ford peace expedition of 1915 (*A. Y. B.*, 1915, p. 121), after preliminary work in arousing popular interest in stopping the European War, was reorganized as a small committee, known as the Neutral Conference for Continuous Mediation, which, sitting at Stockholm, prepared and sent a letter to the belligerent nations suggesting possible solutions of the European conflict, and another letter to neutral Governments urging the calling of a conference for mediation.

The Carnegie Endowment for International Peace. — Although still maintaining the skeleton of its European organization, the Division of Intercourse and Education of the Carnegie Endowment (Dr. Nicholas Murray Butler, acting director) has concentrated its constructive work on the relations of the United States and the Latin-American republics. This has been carried on under the Pan-American division of the American Association for International Conciliation, whose director, Dr. Peter Goldsmith, has made a visit to South America. The Endowment assisted the Second Pan-American Scientific Conference (see *International Relations, supra*) in Washington with an appropriation of $100,000 for the traveling expenses and entertainment of delegates, among whom were eminent scholars, economists and historians of the Latin-American nations. It has granted aid to European periodicals engaged in the diffusion of information on international law and peace. While avoiding needless controversial questions, it has increased the monthly edition of documents of the International Conciliation to 110,000 copies, encouraged international polity clubs in American colleges, furnished pamphlet material on the economics of war and peace to the schools, and provided summer instruction on international relations in 79 universities, colleges and state normal schools,

with the general object of stimulating interest in international relations and of preparing the people of the United States for their increasingly important leadership in the international life of the future. In the Division of Economics and History (Dr. John Bates Clark, director), the publication of many of the 80 or more volumes that at the outbreak of the war were in preparation by the European Committee of Research is suspended, but will be completed later. The Division of International Law (Dr. James Brown Scott, director) has published a series of volumes containing Ladd's *Essay on a Congress of Nations;* an English translation of Grotius' *Freedom of the Seas;* the "Instructions to the American Delegates to the Hague Conferences"; an English translation of the resolutions of the Institute of International Law; the texts of the Hague Conventions, with tables of signatures, ratifications, adhesions, etc.; the decisions of the Hague Court; *Diplomatic Documents Relating to the Outbreak of the War;* and two monographs concerning an international court of justice. Dr. Scott has continued to serve as special adviser to the Department of State and chairman of the Joint State and Neutrality Board, was a vice-president and official reporter of the Second Pan-American Scientific Congress with a view to editing the proceedings, and has been a factor in the initiatory stages of the American Institute of International Law, which, at the time of the Congress, issued a "Declaration of the Rights and Duties of Nations," with an official commentary. Under this division of the Endowment, Alejandro Alvarez, secretary-general of the Institute of Internation Law, has become the first exchange professor from Latin-America in an American institution of learning.

Arbitration and Conciliation.—There have been no new cases before the Permanent Court of Arbitration at The Hague, but announcement is made that Great Britain and Sweden have agreed to submit to arbitration after the war the question of the legality of the seizure of postal parcels (see *International Relations, supra*). The settlement of the controversy between Germany and the United States in regard to the schooner *William P. Frye* has been delayed by an effort to settle the case directly by diplomacy rather than by arbitration (see *ibid.*). The Central American Court of Justice, which was set up in 1907, has adjudicated during the year, favorably to Costa Rica, the case of Costa Rica *v.* Nicaragua involving the violation of the treaty of limits (April 15, 1858) as interpreted by the Cleveland award, both by the substance and manner of the making of the treaty between the United States and Nicaragua (Aug. 5, 1914) relating to a canal route across Nicaragua about which it is alleged Costa Rica, whose land and water rights are affected, should have been consulted (see *ibid.*). A kindred controversy which grew out of the grant by Nicaragua to the United States of the right to establish a naval base in the Gulf of Fonseca has been decided in favor of Salvador, whose rights of self-protection are also claimed to be affected, and of Honduras, whose neutrality, established under the treaty of peace and amity signed at Washington in 1907, is considered compromised. There have been some ratifications and proclamations of treaties for the advancement of peace negotiated on the Wilson-Bryan plan, about 35 of which have been accepted in principle. By article 12 of the treaty between the United States and Haiti relating to the finances, economic development and tranquillity of the latter country (signed at Port au Prince on Sept. 16, 1915, ratifications exchanged at Washington, May 3, 1916), the Government of Haiti agrees to execute with the United States a protocol for the settlement by arbitration, or otherwise, of all pending pecuniary claims of foreign corporations, companies, citizens or subjects against Haiti. (For correspondence between President Wilson and the belligerents of Europe in regard to peace proposals, see *International Relations, supra.*)

IV. FOREIGN AFFAIRS

LATIN AMERICA

ROSCOE R. HILL AND DEAN A. WORCESTER

General Survey of Economic and Political Conditions.—The year 1916 produced much improvement in the general economic situation in Latin America. The depressive conditions created by the European War continued to give way before the benefits derived from the war on account of good prices and heavy demand for the products of the various countries. Commercial and financial conditions underwent considerable readjustment during the year, and most of the countries showed a favorable trade balance and experienced less of budgetary difficulties than during the preceding year. An indication of the improved trade conditions is found in a comparison of the trade between the United States and Latin America for the fiscal years 1915 and 1916. The total amount of the trade of the United States with Latin America for the year ending June 30, 1916, was $1,115,621,000, comprising exports to Latin America of $397,456,000 and imports from Latin America of $718,165,000; for the year ending June 30, 1915, the total was $767,400,000, comprising exports of $242,602,000 and imports of $524,807,000. There continued to be difficulties in regard to shipping facilities, although several republics took steps to relieve the shortage. The need of capital for the development of resources and for the continuance of public works was manifest everywhere. The extension of American banking facilities in Latin America aided in improving financial and commercial conditions.

Pan-Americanism continued to develop, many events taking place which served to strengthen the bonds between the American nations. The Second Pan-American Scientific Congress, which assembled in Washington on Dec. 27, 1915, concluded its labors on Jan. 8. The Congress considered a multitude of subjects in the furtherance of its

> high aims and purposes, namely, to increase the knowledge of things American, to disseminate and to make the culture of each American country the heritage of all American republics, to further the advancement of science by disinterested coöperation, to promote industry, inter-American trade and commerce, and to devise ways and means of mutual helpfulness.

The conclusions of the Congress were embodied in 49 resolutions and recommendations relating to archæological exploration and research, use of the metric system, uniform gauge for railways, forestry, irrigation and reclamation of arid lands, study of the lives of liberators and statesmen, study of the history and life of the Latin-American peoples, teaching of Spanish in the United States and of English in Latin America, interchange of educators between the American republics, increase of facilities for the study of international law, and study of the constitutions, laws and institutions of the various republics. (See also III, *International Relations.*)

The International High Commission, created pursuant to the recommendation of the Pan-American Financial Conference of 1915, held its first meeting in Buenos Aires on April 3-13. Its deliberations resulted in the permanent organization of the High Commission with headquarters at Washington, an agreement to hold a second Pan-American Financial Conference in 1917, plans for a conference on wireless communication and a postal congress, and recommendations looking toward unification of the laws of the various republics. During the year Costa Rica signed the Trade Mark Treaty formulated by the

Fourth Pan-American Conference and made possible the establishment of a single bureau in Havana for the registration of all trade marks from the northern group of American nations. A department of education was established in the Pan-American Union, a forward step in the intellectual relations of the American States.

Pan-American political relations, on the whole, were friendly, but the difficulties of the United States with the Dominican Republic, the Central American republics, and Mexico, were notable exceptions. After extended negotiations, which produced no results because of the attitude of the Dominican Government, the United States intervened in the Dominican Republic and took charge of the administration in order to straighten out the tangled situation (see also *infra*, and III, *International Relations*). The trouble with Central America resulted from the ratification of the Nicaragua treaty, which called forth a vigorous protest from some of the other Central American states (see also III, *International Relations*). The problem of Mexico continued to be most serious, owing to the border raids and the presence of a United States punitive expedition in Mexico (see also III, *International Relations;* and XII, *The Army*).

With the exception of the Central American difficulty, relations among the Latin-American republics were amicable. Treaties looking toward the adjustment of long standing boundary disputes, as well as peace and commercial treaties, were entered into by several countries. Numerous steps were taken in the *rapprochement* of Peru and Chile and efforts were made to reach an agreement respecting the Treaty of Ancon (1884).

The internal political situation of the Latin-American republics was peaceful, except in Mexico and the Dominican Republic. Presidential elections in Argentina, Ecuador, the Dominican Republic, Cuba, Guatemala, Nicaragua, Paraguay and Panama, with minor exceptions, took place in an orderly manner, although in most instances hotly contested.

The following are the more important works relating to Latin America, published during the year:

BARD, H. E.—*South America: Study Suggestions.* (New York, Heath.)

FILSINGER, E. B.—*Exporting to Latin America.* (New York, Appletons.)

FREEHOFF, J. C.—*America and the Canal Title.* (New York, Sully & Kleinteich.)

HALSEY, F. M.—*Railway Expansion in Latin America.* (New York, Moody.)

HART, A. B.—*The Monroe Doctrine: an Interpretation.* (Boston, Little, Brown.)

JONES, C. L.—*Caribbean Interests of the United States.* (New York, Appletons.)

MANNING, W. R.—*Early Diplomatic Relations Between the United States and Mexico.* (Baltimore, Johns Hopkins.)

New Pan-Americanism. (World Peace Foundation.)

O'SHAUGHNESSY, Edith L.—*A Diplomat's Wife in Mexico.* (New York, Harpers.)

ROSS, G.—*Argentina and Uruguay.* (New York, Macmillans.)

SCOTT, J. B.—*Second Pan-American Scientific Congress: Final Act and Interpretative Commentary Thereon.* (Washington, Government Printing Office.)

SCROGGS, W. O.—*Filibusters and Financiers: the Story of William Walker and his Associates.* (New York, Macmillans.)

STEPHENS, Kate.—*Mastering of Mexico.* (New York, Macmillans.)

ZAHM, J. A.—*Through South America's Southland.* (New York, Appletons.)

Argentina.—Victorino de la Plaza was President of Argentina during the first part of the year. After a bitter political campaign, the Radicals, on April 2, won in the popular election a majority of the electors. They won also a majority in the legislative branch of the Government. It was found necessary for the central Government to take over the governments of three of the states during the election. The question of land holdings was one of the most important issues before the electorate, the Radicals advocating that large estates be taxed so heavily that they would be split into smaller holdings. The secret ballot, which was used in this election for the first time, was an advantage to the Radicals. The electoral college met on June 12 and chose Hipolito Irigoyen as President. He is the first Radical to be elected to the Presidency. Pelagio Luna was elected Vice-President. The new administration took office on Oct. 12, to serve until 1922. The Cabinet was formed with Ramón Gómez, Minister of the Interior, at its head. None of the new Cabinet had hitherto been in public service.

Financial and business conditions were greatly improved during the year. There was a large increase in the gold reserve in the Conversion Office and there was a great reduction in bankruptcies. Early in the year an issue was made of 15,000,000 pesos paper (paper peso = $0.42) for the exploitation of the oil fields. In July work was resumed on the port improvements at Buenos Aires, which had been suspended at the outbreak of the European War. During the first six months of the year, the imports amounted to 104,966,451 gold pesos (gold peso = $0.9647) and the exports to 246,057,367 gold pesos, a total trade of 351,023,818 gold pesos. Crops were unusually good throughout the country. There was a good deal of opposition to the A.B.C. agreement of 1915 (*A. Y. B.*, 1915, p. 123) because in the commission of arbitration Brazil and Chile would have two votes to one for Argentina.

Important legislation included a workmen's-compensation act and a decree regulating immigration in order to insure a better class of immigrants. Immigrants are now required to bring, besides a photograph, a certificate that at no time within 10 years previous to their entry have they committed any act against society in their native land. The census of 1914 was announced in July and showed a total population of 7,885,237, an increase of 3,920,326 since 1895. On July 9 was celebrated the centennial of the signing of the Declaration of Independence.

Bolivia.—In January President Ismael Montes of Bolivia reorganized the Cabinet. The country found itself in financial difficulties on account of a large deficit in the budget. To care for this deficit an issue was made of interest-bearing treasury bonds which were taken by the banks of the country. The bonds were issued at nine per cent. and taken at 95. They were guaranteed by 20 per cent. of the customs receipts, the importer paying 20 per cent. of duties in warrants. The moratorium law was extended to June 30, 1916. Arrangements for the exportation of tin to the United States made possible a large increase in trade. In January laws went into effect providing for Sunday closing and Sunday rest and prohibiting the sale of alcoholic drinks. Work was continued upon the La Quiaca-Tupiza railroad, which is to connect Bolivia and Argentina and is expected to be completed within two years.

A great deal of interest centered in political affairs, although the Presidential election does not occur until 1917. The Congressional elections on May 7 resulted in a victory for the Government party, the most prominent leader of the opposition, Daniel Salamana, failing of reëlection. Criticism of the administration was mainly on matters of financial policy. In September José Gutierrez was nominated by the Liberals to succeed Montes for the Presidency. The Liberals are firmly in power and the Conservatives show little strength. In his annual message of Aug. 6, President Montes reported that the financial conditions were much improved.

The protocol regarding the boundary between Bolivia and Paraguay was renewed for six months. The question of the boundary between Bolivia and Argentina was under consideration.

Brazil.—On Jan. 1 President Wenceslau Braz of Brazil sanctioned a new Civil Code, which goes into effect on Jan. 1, 1917. The Code provides for the protection of the property rights of inventors and authors; for the rights of land owners to surface and subsoil of, and the air above, their holdings; for the regulation of water rights and land boundaries; for the protection of the homestead right, and that no man be deprived of it by legal processes; that a wife may buy the necessities of life and that the husband may not stop the credit of the wife for such purchases; and that the wife who earns a salary may dispose of it freely. Congress, which closed in March, enacted many financial measures, among which were acts modifying the collections on imports, suppressing unnecessary posts in public service, regulating the collection of taxes on commerce and upon capital invested in rented lands, establishing a tax upon capital invested in city real estate, and substituting a new table of rates for the collection of taxes on incomes. The budget for 1917 provides for an expenditure of

97,750 contos gold (gold conto = $546) and 406,388 contos paper (paper conto = $250). Brazil is to resume interest payments on its debt.

A cotton convention was held May 1-10 under the auspices of the National Agricultural Society. In April there was a decree of the Government guaranteeing the deposits of savings banks and thus promoting a close relationship between the Government and the banks. Other interesting events of the year were the organization of the Union for the Advancement of Education and of the League in Favor of the Allies, the latter formed to express sympathy with France and her Allies and including as members many of the leading men of Brazil; a scandal over the sale of munitions to the Allies, in which a number of high officials and diplomats were involved; and the appearance of monarchial propaganda in São Paulo. Late in the year there was agitation for the taking over of German shipping in Brazilian ports.

Chile.—A ministerial crisis in Chile over the question of direct taxation arose in the closing days of the administration of Ramón Barros Luco, whose term expired on Dec. 22, 1915. The new President, Juan Luis Sanfuentes, whose election was the result of a coalition of the Liberal Democrats, also found difficulty in the formation of a Cabinet. His first Cabinet gave places to the opposition Liberals. After one week, because of the opposition of the Senate, this Cabinet resigned, and a second cabinet was formed, composed of three members from the Liberal-Conservative coalition (Conservative, Liberal, Democratic and National parties) and three members from the Liberal Alliance (Liberal Democratic and Radical parties). Difficulties arising from the various factions and groups caused in the early fall a third revision of the Cabinet, consisting of Liberals and Liberal Democrats, a surprise to the Conservatives. In his first Presidential message Sanfuentes reported cordial foreign relations, especially with Argentina and Brazil, and recommended reforms in the method of election of President, the creation of a Department of Agriculture for the development of resources, colonization schemes, the need of particular attention to public education, and the ratification of the protocol of 1907 with Peru, which had to do with adjustment of difficulties over the Treaty of Ancon (1884). In a second message to Congress, President Sanfuentes advocated the establishment of a Ministry of Agriculture, the reorganization of the police system, the reform of excise taxes, the protection of the merchant marine, the reorganization of the Department of Public Works, the construction of new ports, a workmen's-compensation act, and that the Government in its purchases give preference to national products.

The debt confronting the country at the beginning of the new administration was £34,556,380. The financial condition, due largely to the increased nitrate production, is greatly improved. In February a bill was passed forbidding the sale of Chilean steamers to foreigners, a means adopted the year before to secure funds. In June provision was made for an international loan of $7,300,000 at six per cent. for the completion of the port works at Santiago, for the payment for port works at Valparaiso and San Antonio, and for the construction of shops. It was decided also to issue 30,000,000 paper pesos (paper peso = $0.14) in treasury warrants at eight per cent.

An arbitration treaty with the United States greatly lessens the possibility of disputes between these countries. The treaty provides that in case of any disagreement a commission of five members shall be appointed, each country naming two, only one of whom shall be a citizen of that country, and these four members choosing the fifth. Six months are allowed for the acceptance of the findings of this commission and if they are then refused, the matter is to be referred to The Hague. Late in the year Great Britain turned over to Chile six submarines, constructed in the United States, in payment for the seizure, at the opening of the war, of warships being constructed in England for Chile.

Colombia.—The administration in Colombia was in charge of President José Vicente Concha, who was elected in 1914 for a term of four years. In

spite of measures taken in 1915 to relieve the financial situation (*A. Y. B.*, 1915, p. 127), the country experienced a large deficit in the budget. The figures for 1916 were estimated to be: revenue, $14,749,000 gold, and expenses, $15,785,579. Conditions in this respect, however, were better than they were in 1915. A decree of March 1 ordered the retirement of the depreciated paper money in exchange for gold or gold notes. In August a loan of 15,000,000 gold pesos (gold peso = $1.00) was approved for the sanitation of ports and for the construction of public works. The city of Bogota floated a loan with the American International Company of New York for $5,000,000 at six per cent. at a price to yield 7.5 per cent.

On Jan. 3 A. J. Cadavid, the new Minister of War, undertook a programme of preparedness for peace, for the training of the army, and for the establishment of munitions factories. A decree of Feb. 17 provided for compulsory military service, and later in the year a mission of Swiss officers was engaged to carry out the reorganization of the army. There was much discussion of the educational system and the need of scientific direction in educational matters. The great defect in the system has been the adherence to the colonial classicism. A plan for the organization of a Chamber of Commerce was carried out, and a law was passed offering premiums for the importation of thoroughbred cattle.

Costa Rica. — Alfredo Gonzales Flores, chosen in 1914 for a term of four years, was President of Costa Rica during the year. Congressional elections were held in December, 1915, for the year 1916. These elections resulted in a victory for the Republican party, which is the party of the Administration. There was a great deal of agitation for tax reform. On May 1 a destructive earthquake in San José caused much property loss, although few lost their lives.

Costa Rica on March 26 brought suit in the Central American Court of Justice for infringements of rights in the negotiation of the Bryan-Chamorro canal treaty between Nicaragua and the United States. The Court ruled on Sept. 22 that the treaty violated the rights of Costa Rica as fixed by the Cañas-Jerez treaty of April 15, 1858, the Cleveland Award of March 22, 1888, and the Central American Peace Treaty of Dec. 20, 1907; but that the Court could not declare the United States-Nicaraguan treaty null because the United States is not subject to its jurisdiction. Costa Rica protested to Nicaragua and the United States, but without effect, and later withdrew her representative from Nicaragua. (See also III, *International Relations.*)

Cuba.—President Mario Menocal, Conservative, who had given Cuba a most efficient and just administration, was a candidate in 1916 to succeed himself. The political campaign was very bitter, the Liberals opposing the election of Menocal and charging the Conservatives with an effort to establish themselves permanently in power. The platform of Alfredo Zayas, the Liberal nominee, was very progressive and included revision of the tariff, reduction of the budget, the abolition of sinecures, a better diplomatic service, creation of schools, establishment of free ports, commercial treaties, and the fostering of agriculture. Fearing to have Menocal in charge of the elections, the Liberals undertook to pass a bill requiring that a President who was running for reëlection should resign 65 days before the election. The bill passed but was vetoed by Menocal. The Liberals could not pass it over the veto. They then suggested that the United States be asked to supervise the elections. The election was held on Nov. 1 but was so close that a contest resulted which was not decided at the close of the year.

Pursuant to the policy, inaugurated in 1915, of extending the educational system of the country, a naval school was established in October. In January a special commission was appointed to make a study and to report on the proposed nationalization of the railways. This measure was advocated because of the high cost to the Government of the carrying of the mails and the transportation of troops and officials, and because of the injury done to the agriculturists by the raising of freight rates.

Dominican Republic.—There was much opposition to Juan Isidro Jiménez, who assumed the Presidency of the Dominican Republic in December, 1914. This opposition, which had been the cause of several revolutionary uprisings, culminated on May 1 when Jiménez was impeached for alleged violations of the Constitution in connection with the budget. Jiménez resigned on May 7 after a comparatively mild revolution lasting two days. On May 15 American marines entered the city of Santo Domingo to guarantee free elections. In June Jacinto de Castro was appointed President by Congress. On July 1 there was an engagement between American marines and Dominican revolutionists, but an agreement was reached on July 5 between Rear-Admiral Caperton and the revolutionists supporting General Arias providing for disarmament and further discussion of domestic affairs. Before this there had been armed conflicts at Monte Christi and Puerto Plato, where marines had landed to restore order. On July 26 Francisco Henríquez y Carvajal was proclaimed Provisional President until the elections of Aug. 15, when he was elected for a term of five months on condition that he would not be a candidate for reëlection. A Cabinet was formed representing various parties.

On Aug. 20 Clarence H. Baxter, American receiver-general of customs, advised the suspension of payments to Dominican officials until an understanding should be reached concerning certain articles of the American-Dominican convention of 1907, or the recognition of the present Dominican Government by the United States. This recommendation was adopted and it led to resistance on the part of the Dominicans, which in turn resulted in intervention by the United States in November. A conflict took place on Nov. 29 and 30 at Macoris, where Governor Perez resisted the American forces which appeared to set up a military government. This engagement resulted in the dispersion of the Dominicans. (See also III, *International Relations.*)

Charles N. Johnson, the American fiscal agent, resigned on June 15 because of his disapproval of the policy of President Wilson towards the Dominicans. A new political party was formed to combat the excessive use of personalities in politics.

Ecuador.—Leonidas Plaza was President of Ecuador until Aug. 31, at which time he was succeeded by Dr. Alfredo Baquerizo Moreno. President Moreno, a Liberal, was elected on Jan. 12 over Arizaga, the Conservative candidate. The campaign was bitter and waged upon personalities, very little constructive suggestion being offered by either side. The elections for representatives in Congress, on the other hand, which was held on May 15-18, were characterized by apathy and indifference. A liberal programme was promised. A law was passed providing that workmen be not compelled to work more than eight hours a day without extra pay and that 50 per cent. of the employees of all industrial and commercial establishments must be Ecuadorians. In June, in an effort to keep down the price of sugar, a decree was published forbidding exportation during the period of the war. A treaty with Colombia for the adjustment of the long standing boundary dispute was signed in July and ratified by Ecuador on Aug. 15.

Guatemala.—President Manuel Estrada Cabrera continued to be the dominant figure of Guatemala. In the elections held on Jan. 17 he was a candidate to succeed himself and was chosen for the Presidency for the fifth time. The term is for six years, commencing in March, 1917, and President Cabrera, at the end of that time, will have served in this capacity for 19 years. Although the country has not been entirely at peace throughout his administration, there has been no revolt of large proportions and there has been a great advance along the lines of government, of commerce and of education. A system of compulsory education is one of the reforms introduced. The exports from Guatemala to the United States during the first six months of 1916 showed a marked increase. The budget for 1916-1917 estimated the receipts at 65,095,692 pesos (peso = $0.03).

Haiti.—The chief executive of Haiti during the year was Gen. Sudre

Dartiguenave. Internal conditions were far more peaceful than they were in 1915. There was a small revolt during the first week of January at Puerto Principe which was speedily put down by American forces. An amnesty was proclaimed on Feb. 4 to all those who took part in the revolt in the city of Cayes on Dec. 1, 1915. On Feb. 28 the United States Senate ratified the treaty of 1915 (*A. Y. B.*, 1915, p. 130) which provides that customs and police supervision shall be under American control and that a native constabulary shall be formed under the command of American officers; and further that the United States shall guarantee the territorial integrity of Haiti (see also III, *International Relations*). The treaty is designed to stabilize the Government and to discourage insurrections.

The Cabinet resigned on May 5, and there was a bitter conflict between President Dartiguenave and the Senate over the procedure in regard to the formation of a new constitution which shall conform with the treaty with the United States. The President threatened to resign unless the Senate should abide by the decree of dissolution. Congress entered a protest to the Government and Congress of the United States against what it considered to be a violation of its rights. Rear-Admiral Caperton supported President Dartiguenave in the controversy. The Cabinet was reorganized on May 10. On Aug. 24 a protocol was signed at Washington which embodied details of the treaty of 1915. The budget for 1916 estimated an expenditure of $3,999,732 and 3,479,821 gourdes (gourde = $0.9647).

Honduras.—Francisco Bertrand was elected President of Honduras in November, 1915, for a term of four years. Alberto Membrano was chosen Vice-President. President Bertrand really succeeded himself, as he had resigned from the Presidency six months before election in order to comply with the law requiring that no one shall become President who has held the office during the six months preceding the inauguration. During his administration President Bertrand has greatly strengthened relations between Honduras and the United States. Much constructive work has been carried out, including the construction of roads, bridges and railroads; the establishment of schools, the reorganization of the Department of Public Instruction, the remedying of defects of the judiciary, the favoring of the investment of foreign capital, reforms in the customs duties, the fostering of agriculture, and measures looking towards the civilization of the natives.

Work was carried on during the year on the Honduras section of the Pan-American Railway. A law was passed providing for the inspection of banks of issue. The budget for 1916-1917 estimates the receipts at 5,476,400 pesos (peso = $0.50). Measures were taken to provide greater economy in administration.

Mexico.—Conditions of anarchy prevailed in Mexico throughout the year. Gen. Venustiano Carranza, who was recognized as head of the *de facto* Government in 1915, continued his efforts to secure complete control of the country. During most of the year he maintained his capital at Dolores Hidalgo and Queretaro. The outstanding features of the year were the efforts of Carranza to reorganize the administration and rehabilitate the country, the factional opposition to the Carranza *régime* by Villa and other rebel leaders, and the difficulties of the *de facto* Government with the United States, which resulted from border raids and the sending of an American punitive expedition into Mexico (see I, *American History;* III, *International Relations;* and XII, *The Army*).

In the effort to restore civil government and rehabilitate the distracted country, Carranza issued many decrees. Some of these had a decidedly anti-foreign character, especially that of Aug. 17, which provided that no concessions would be granted to foreigners or foreign companies until they renounced all treaty rights and agreed to accept only the same privileges as Mexicans. Numerous decrees dealt with finance. On Feb. 27 it was ordered that all notes issued by the Constitutionalist Government must be recognized and redeemed when presented. Three decrees of

April 3 provided for a monetary commission to reorganize the currency system, for the formation of a fund to guarantee the circulation of the fiduciary currency, and for the substitution of a new issue of paper currency to take the place of the old issues. Considerable difficulty was experienced in placing the new issue of paper in circulation. An order of June 3 withdrawing from circulation all notes over 20 pesos in value nearly paralyzed business. On Sept. 15 Carranza declared that all banks should bring their metal reserves up to the amount of their outstanding notes within 60 days or be declared insolvent. This decree called forth a vigorous protest from the French and British diplomatic representatives. A decree of Dec. 12 stated that salaries of government employees would be paid in gold at the rate of pay in 1912. On Oct. 7 it was ordered that bull fighting should be suspended until order is restored in the country. A decree of Sept. 30 provided for the abolition of the Vice-Presidency, the reduction of the Presidential term from six to four years, and no reelection. A number of states issued orders forbidding the sale of real property to foreigners.

Municipal elections were held on Sept. 3, and on Oct. 22 delegates were chosen to a constitutional convention. The convention met in Queretaro on Nov. 20, but had not terminated its labors by the close of the year.

At the beginning of the year, Villa, who had been declared an outlaw, seemed almost crushed. He continued his activities, however, and numerous battles were fought between Villistas and Carranzistas. Apparently believing he could not defeat Carranza, Villa proceeded to provoke an American intervention. A massacre of the American miners at Santa Isabel (Jan. 10) and the raid on Columbus, N. M. (March 9), in which a number of Americans were killed, were the steps taken for this purpose. These acts resulted in the sending of a punitive expedition into Mexico (see also III, *International Relations;* and XII, *The Army*), for the purpose of capturing Villa and dispersing his forces and of protecting Americans in Mexico and on the border. On March 27 Villa captured Guerrero and put many Carranzistas to death. Two days later he was defeated by Colonel Dodd and his forces scattered. Villa, who was wounded, disappeared into the mountains and remained inactive during the summer.

The presence of the punitive expedition in Mexico was considered a violation of Mexican territory by Carranza and he made insistent demands for the immediate withdrawal of the American forces. Additional border raids, the Parral incident (April 12) and the battle of Carrizal (June 21), between Americans and Carranzistas (see XII, *The Army*), served to bring the relations of Carranza and the United States to the breaking point. Continued efforts, however, were made to seek an adjustment of the problem. In July Carranza proposed that a joint commission should be formed to discuss the withdrawal of the American troops and other matters pertaining to the relations of the two countries. The proposal was accepted, the commission was appointed in August, and began its labors on Sept. 4. After much discussion a protocol was signed in November providing for the withdrawal of the American troops in case the *de facto* Government seemed able amply to protect American citizens in Mexico and prevent border raids. The protocol was not satisfactory to Carranza, and its status was still undetermined at the close of the year. (See also III, *International Relations.*)

At the time of the signing of the protocol, Villa, who had renewed his activities in September, attacked the city of Chihuahua (Nov. 23) and after four days of severe fighting captured it. After sacking the place, Villa withdrew to the westward with his booty and the Carranzistas reoccupied the city. Villa announced that he would make war on the Americans. He continued his operations against Carranza until the close of the year. These events showed the weakness of the Carranza Government and served to leave the question of the withdrawal of the American troops undecided.

Zapata continued to control the state of Morelos, and the capture of

one of his strongholds, Ajusco (Feb. 13), did not serve to bring him into subjection to Carranza. In July a so-called Legalista movement was started under the leadership of Felix Diaz for the purpose of overthrowing Carranza and Obregon. Although Diaz landed in Mexico, the movement made little headway.

Nicaragua.—The chief executive of Nicaragua for the year was Adolfo Diaz, who was elected in 1912. The Presidential elections took place on Oct. 2, when Emiliano Chamorro, who was formerly Minister at Washington, was elected, to take office on Jan. 1, 1917, for a term of six years. He was opposed by Carlos Cuadra Pasos, the nominee of the Friends of the Government, and by Julio Irias, the candidate of the Liberal party. The election aroused a good deal of bitter feeling and many of the adherents of Irias refused to vote, declaring that the presence of American warships and the moral backing of Chamorro by Washington, materially affected the results.

The Bryan-Chamorro Treaty with the United States on the subject of the canal route (*A. Y. B.*, 1913, p. 91) was ratified by the Nicaraguan Congress on April 11, having already been ratified by the Senate of the United States on Feb. 18. This greatly stimulated business conditions. The treaty was opposed by Costa Rica and Salvador. Costa Rica claimed that under the convention with Nicaragua of 1858, she was to have a voice in any treaty relating to canal rights. Salvador protested that the treaty violates the provision of the Washington Convention of the Central Americas of 1907, guaranteeing the neutrality of Honduras. Costa Rica presented her claims to the Central Court of Justice which decided against Nicaragua. Nicaragua refused to abide by the decision of the Court. Both Costa Rica and Salvador protested to the United States but without effect. (See also III, *International Relations.*)

Panama.—Belisario Porras was the chief executive of Panama until Oct. 1, when Ramon M. Valdez was inaugurated as President. The campaign was very vigorous, and as early as January, as well as subsequently, the United States was requested to supervise the election held on July 12. Valdez was opposed by Rodolfo Chiari, also a Liberal, although Valdez represented the party of the Government. On May 14 the United States demanded and secured the surrender of the arms of the Panama police, although the action was protested by some of the citizens. There were some slight disturbances at the time of the election. Many of the followers of Chiari refused to vote, protesting to the United States and alleging the use of fraud and force and accusing the Government of wanting to sell Colon and, indeed, of having already sold large amounts of land to Japanese agents.

The National Exposition of Panama, which commemorated the discovery of the Pacific by Balboa and the opening of the interoceanic canal, was opened the first week in February. A Congress of Christian Work in Latin America was held on Feb. 10-20 (see also XXVIII, *Religion*). A loan was negotiated with Chicago and New York bankers for $1,250,000 for 12 years at five per cent.

Paraguay.—President Eduardo Schaerer's term expired on Aug. 15. Peace and political progress marked his administration, although there were some attempts at revolt. In the Presidential campaign, Manuel Gondora was nominated by the Radical party but refused the nomination on the ground that it would be a violation of the constitution, which provides that two terms shall elapse before a reëlection. Gondora was President in 1912. The convention then nominated Manuel Franco, who was elected on May 7 and inaugurated on Aug. 15.

The moratorium was extended to Dec. 31, 1917, but it was provided that, beginning with March 31, 1916, payment should be made of four per cent. of the principal on debts contracted prior to Aug. 14, 1914. These payments are to be made quarterly for one year. In 1917 a payment of six per cent. per quarter is to be made. The total foreign debt on Dec. 31, 1915, was £1,153,503 and 68,227 Argentine gold pesos (Argentine gold peso = $0.9648). The budget of 1915 was, by executive decree, in

force for the first six months of the year. The budget for 1916 estimated revenue at 2,223,937 pesos gold and 38,463,600 pesos paper, and expenses at 2,130,607 pesos gold and 42,767,160 pesos paper. There was a good increase in trade during the year and a favorable trade balance.

A law was passed on Jan. 4 for the paving of the streets of the capital and providing for a bond issue of 1,000,000 gold pesos for that purpose. In January also provision was made for a bureau of conversion of five members, who should fix the rate of conversion, establish and issue the circulating medium, and ultimately retire the depreciated paper. A law was also promulgated for compulsory military service to go into effect on Jan. 1, 1917. Men between the ages of 18 to 28 are to be in the regular Army or Navy and men from 28 to 45 are to be in the reserve. There are three classes of reserves: ages 20 to 29, the reserve of the regular army; 29 to 39, the national guard; and 39 to 45, the territorial guard. Among the reforms promised by the new administration are: the secret ballot, Congressional representation according to population, a firm currency basis, army reforms, judiciary reorganization, changes in taxation, and economy in administration.

On July 8 a commercial treaty was signed with Argentina which provides for great freedom of trade. With a few exceptions, all products are to be free of duty for five years.

Peru.—President José Pardo of Peru resigned on account of ill health on March 15 in favor of the first Vice-President Ricardo Bentin. In his message he had called attention to economic affairs, which, although in bad shape at the outset of his administration, now have a satisfactory outlook. Due to mismanagement in previous years, the national debt had risen to $8,559,679 on Dec. 31, 1915, and the revenue had fallen off 40 per cent. To remedy this it was necessary to practice strict economy and to create new resources. For this purpose new taxes were imposed, including an inheritance tax, varying from one per cent. to 11 per cent., a 10 per cent. duty on many hitherto free articles, and a new export duty on minerals. Financial conditions improved steadily throughout the year, there being a large increase in both exports and imports and a corresponding increase in customs receipts. The increase in oceanic freight rates, however, was a serious handicap to Peruvian commerce. The budget for 1916 contemplated receipts of £2,686,950 and expenditures of £2,920,159. The budget for 1917 estimates expenses at £3,412,237.

Early in the year the Peruvian Minister at Washington was recalled because the Government could not afford to keep up the legation. It was rumored in July that Peru and Venezuela had entered upon a secret agreement to seize large tracts of land involved in boundary disputes with Colombia and Ecuador. The Peruvian Supreme Court held that contracts made under Peruvian laws could not be affected by the British "Trading with the Enemy" Act (see III, *International Relations*). A peace treaty was completed between Peru and Uruguay which provides for a commission of five members to which shall be submitted all questions, not constitutional, which do not yield to ordinary diplomacy. This commission shall have at least one year in which to investigate, and after their report there shall be a six months' delay, after which, should a settlement still be impossible, the matter shall be carried to The Hague. The treaty is for five years and is to be continued indefinitely unless one country wishes to withdraw.

Salvador.—Carlos Meléndez was reelected President of Salvador in 1915 for a term of two years. His administration so far has been a peaceful one and many reforms have been made in spite of the straitened financial conditions. In the President's message of 1916, particular attention was called to the notable progress which has been made along the lines of education. The economic situation showed great improvement. Measures were taken for the making and improvement of roads and a new income tax was put into effect. The duty on print paper was removed and a tax of $10 a year on lawyers was abolished. Several of the larger towns were installing water systems.

Uruguay.—Feliciano Viera was the chief executive of Uruguay during the year; his term expires in 1919. Much interest was taken in a proposed new constitution. The reforms were suggested largely by ex-President José Batlle y Ordóñez, who had, in general, the support of the Colorado party, although the party was by no means a unit in the matter. There was a good deal of opposition to the plan, especially to that part providing for a commission form of government. The constitution proposed that a commission of nine members be in charge of the executive side of the government, to have all of the regular powers of the President. Two of these commissioners were to be chosen by Congress and seven to be elected. The term was for six years, one member to retire each eight months. The proposed constitution also provided for the direct election of Senators, for the referendum, and for the separation of church and state. The elections held in the fall for the constitutional assembly resulted in the defeat of the adherents of the collegiate-government system.

On Jan. 13 a law was passed requiring absentee land holders of real property to pay double taxes. Exemptions were made in the cases of concessionaires, students, consuls, and diplomats. The law providing for the eight-hour day was put into force on March 17. There was considerable difficulty in the enforcement of this law because of widespread opposition. A decree issued in April undertook the control of outdoor advertising by means of taxation. An industrial law was passed which created primary and secondary education along industrial lines. The Senate sanctioned the old-age pension act and an inheritance tax was imposed, of one per cent. to seven per cent. on near relatives and 11 per cent. to 27 per cent. on strangers and distant relatives. A law was passed providing for government control of the post offices and the telephone and telegraph lines, these to be under the special direction of a board composed of seven members. The budget for 1916-17 estimated expenses, 29,521,666 pesos, and receipts, 29,451,428 pesos (peso = $1.034).

A five-year peace treaty with Peru was concluded (see "Peru," *supra*).

Venezuela.—Juan Vicente Gómez was elected to the Presidency of Venezuela in 1915 to serve until 1922. As a matter of fact he has never taken the oath of office and Márquez Bustillos is still acting as President although Gómez is really in power. Important legislation in regard to education, begun in the year 1915, was carried forward during the year. On Jan. 3 there was a decree creating a naval school at Puerto Cabello, the formal inauguration of which took place on April 19. The intense interest in foreign languages was evidenced by the creation by a Presidential decree of a School of Foreign Language in Caracas. A new civil code was published during the year.

The construction of a highway from Caracas to San Cristobal has been commenced under the direction of the Minister of Public Works. The route is 683 miles long. It will be the largest work ever undertaken by the Government and will be attempted without the aid of contractors.

CANADA

ERNEST H. GODFREY

The Governor-General.—On Oct. 13, 1916, the Duke of Connaught completed five years' service as Governor-General and Commander-in-Chief of the Dominion of Canada. Originally appointed for a period of two years, His Royal Highness eventually fulfilled the entire term of five years during which it is customary for the Governors-General of Canada to hold office. Throughout this time the Duke had mingled freely with the people of Canada, winning their sincere esteem and loyal affection. The Royal party left Canada on Oct. 16. The Duke of Devonshire (Victor Christian William Cavendish), appointed Governor-General and Commander-in-Chief of Canada in succession to the Duke of Connaught, arrived at Halifax, N. S., on Nov. 11.

Canada and the European War.—The great war has continued to engage the chief national energies of

Canada. On Jan. 12 an order-in-council gave legal authority for an increase of the Canadian troops to 500,000 men, and during the year earnest efforts to recruit, train and equip additional soldiers have been put forth throughout the whole of Canada. On Nov. 30 the number of recruits enlisted reached a total of 381,438. From the beginning of the war to Dec. 31, 1916, the casualties among Canadian troops have numbered 67,890, as follows: killed in action, 10,854; died of wounds, 4,010; died of sickness, 494; presumed dead, 1,108; wounded, 48,454; missing, 2,970. The splendid valour and heroism of the troops at the front have been a source of keen gratification and pride to the people at home, who in numerous ways have striven to sustain the national and imperial cause for which the war is being waged. The women of Canada have shown noble devotion and enthusiasm in the raising of funds, the provision of comforts and the institution of various associations for the assistance of soldiers and their dependents. A special government inquiry revealed that up to March 31, 1916, the total value of Canadian patriotic contributions to 33 different funds actually paid amounted to $27,881,165. At the end of December the total contributions to the Canadian Patriotic Fund, the principal fund, which had received $9,554,981 up to the end of March, amounted to $18,373,494, and the disbursements to $14,373,722, leaving a balance in hand of $3,999,772.

On Nov. 11 Gen. Sir Sam Hughes, who had been Minister of Militia and Defence since October, 1911, tendered his resignation of this office at the request of the Premier (Sir Robert Borden), conveyed by letter of Nov. 9, in consequence of disagreement on matters connected with the overseas administration of the Department. The questions in dispute were referred to in a series of letters exchanged between the Premier and Sir Sam Hughes from Oct. 18 to Nov. 11, which letters were communicated to the press and published on Nov. 15. In one of these letters, dated Oct. 18, Sir Robert Borden wrote: "I thoroughly appreciate the great ability, the wonderful energy and the unequalled resourcefulness which you have placed at the services of the country ever since the outbreak of the war." General Hughes' resignation was accepted, and on Nov. 23 the portfolio of the Department of Militia and Defence was given to the Hon. A. E. Kemp, already a member of the Cabinet without portfolio. On Oct. 28 Sir George Perley, Acting High Commissioner in London, was appointed by order-in-council as Minister of the Overseas Military Forces for Canada in the United Kingdom. In October a National Service Board for Canada was established with the object of securing the largest available military forces, subject to the maintenance of all important industries.

Finance, Trade and Revenue.—To meet the expenses of the war three appropriation acts, aggregating $550,000,000, have been passed since 1914, the latest of these acts, passed on May 18, 1916, for $250,000,000, being intended to provide for expenditures up to the end of the fiscal year on March 31, 1917. To provide for expenditure on public works under contract and other capital outlays, a loan of $45,000,000 was raised in the United States in August, 1915. In addition to the war loan of $100,000,000, subscribed for in Canada in November, 1915, a second internal war loan of similar amount was successfully raised in Canada in September, 1916. This loan is in the form of bonds maturing on Oct. 1, 1931, bearing interest at five per cent. payable half yearly, and is exempt from taxes. On March 31, 1916, the net public debt of Canada stood at $615,156,171, an increase of $300,854,545, as compared with $314,301,626, the amount of the net debt on March 31, 1913.

The business of the country has adjusted itself in a remarkable way to the altered conditions created by the war. For the fiscal year ended March 31, 1916, the aggregate trade of Canada, excluding coin and bullion, was of the value of $1,309,545,664, as compared with $958,894,411 in 1914-15, and $1,090,948,716 in 1913-14. It represents the largest aggregate trade in the history of the Dominion. The increase in 1915-16, as compared with 1914-15, is $350,651,253, or 36.6 per cent.; and as com-

pared with 1913-14 it is $218,596,948, or 20 per cent. A considerable proportion of the increased value of Canadian exports during the last two years has been due directly to the war, large increases being shown for grain, hay, boots and shoes, cartridges, explosives and fulminates, metals, minerals, iron, steel and manufactures thereof. In 1915-16 the total trade of the Dominion with the United Kingdom was $540,057,644, as compared with $302,112,198 in 1914-15. With the United States it was $610,083,822 in 1915-16, as compared with $495,014,031 in 1914-15; while the trade with countries other than these two was $159,404,198 in 1915-16, as compared with $161,768,182 in 1914-15. An important effect of the altered conditions caused by the war is the entire reversal of the Canadian balance of trade. This before the war was adverse to Canada to the extent of 43.17 per cent. for the year ended March 31, 1913. For the fiscal year 1915-16 the balance is a favorable one to the extent of 56.40 per cent. The total trade of Canada for the eight months ended Nov. 30, 1916, exclusive of coin and bullion, was of the value of $1,280,973,056, as compared with $750,147,842 for the corresponding period of 1915. Imports for home consumption during this period were $534,852,286, as against $298,232,602, and total exports were $746,120,770, as against $451,915,240 the preceding year.

For the fiscal year ended March 31, 1916, the total revenue of Canada was $172,147,838 and the ordinary expenditure apart from the war was $130,350,727, leaving a surplus of $41,797,111, devoted towards payment of the principal of the war expenditure. The ordinary expenditure includes, however, interest on sums borrowed for the war, as well as amounts paid in war pensions.

Agriculture.—Although the harvested area of wheat for 1916 proved to be 1,795,800 acres, or 12.2 per cent. below the record of 1915, it was yet considerably higher than in any year before 1915. The spring of 1916 was late and seeding was difficult in consequence of heavy rains, but the western prospects for grain were excellent until towards the end of July, when rust in Manitoba, due to murky atmosphere and extreme heat, began to cause serious apprehension. Unfortunately, after this wheat rust spread with great rapidity through Manitoba and Saskatchewan, the southern parts of these provinces suffering most, and within a short time the general outlook for a successful wheat harvest was completely changed. At the end of the year, the Census and Statistics Office estimated that of 13,886,400 acres sown to spring wheat, 1,428,000 acres, or 10¼ per cent., would be entirely unproductive, while 515,500 acres, or 3¾ per cent., would be cut green. The yield per acre of the wheat crop was reduced in consequence of rust by at least 10 bus. in Manitoba and five bus. in Saskatchewan, which represents a loss to the farmers of these provinces of about $50,000,000, besides that occasioned by the lowering of grade, which is considerable. The total yield of wheat for the whole of Canada, as provisionally estimated by the Census Office was 220,367,000 bus., as compared with 426,747,000 bus., the final estimate for 1915. The table opposite shows the areas and yields of the principal field crops of Canada for the two years 1915 and 1916, the yields of 1916 being the latest census estimates, subject to final revision after the close of the year. Percentage comparisons are given with the record crop of 1915 and with the annual averages for the five years ended 1915.

For the crop year ended Aug. 31, 1916, the total exports of wheat and wheat flour expressed as wheat amounted to 289,794,162 bus., the largest quantity of wheat exported from Canada in any single year.

A favorable feature of the situation from the producer's point of view has been the great rise in the prices of grain since the outbreak of the war. The price of No. 1 Northern wheat at Winnipeg rose from 90⅞ cents per bushel in July, 1914, to $1.62 in May, 1915, and to $2.05 in November, 1916. At the average price of $1.50, the value to farmers of the wheat crop of 1916 proved to be $289,374,000, as compared with $352,359,400 for the large crop of 1915 and with $196,418,000 for the small one of 1914, the

ACREAGE AND YIELD OF FARM CROPS

Crop	Acreage				Production			
	1915 (000 omitted)	1916			1915 (000 omitted)	1916		
		Total (000 omitted)	Per cent. of 1915	Per cent. of Average[1]		Total (000 omitted)	Per cent. of 1915	Per cent. of Average[1]
Fall wheat.....bus.	1,124	937	83	90	32,392	20,131	62	82
Spring wheat.... "	13,551	11,943	88	113	394,355	200,236	51	87
All wheat..... "	14,675	12,880	88	109	426,747	220,367	52	86
Oats..... "	11,425	9,835	86	95	523,684	351,174	67	88
Barley..... "	1,708	1,651	97	104	60,699	41,318	68	86
Rye..... "	112	145	129	121	2,394	2,896	121	124
Peas..... "	196	150	77	64	3,479	2,166	62	56
Beans..... "	43	33	75	68	723	541	75	63
Buckwheat..... "	344	342	99	92	7,866	6,720	85	77
Mixed grains.... "	467	398	85	82	17,523	10,333	59	63
Flax..... "	807	606	75	48	10,628	7,122	67	58
Corn for husking. "	253	173	68	61	14,368	6,271	44	39
Potatoes..... "	479	449	94	94	62,604	61,128	98	80
Turnips..... "	173	156	90	83	64,281	41,256	64	58
Hay and clover..tons	7,875	7,974	101	97	10,953	14,799	135	127
Fodder corn..... "	343	297	87	95	3,430	1,977	58	66
Sugar beets..... "	18	15	83	88	141	71	50	46
Alfalfa..... "	93	90	97	94	262	261	100	106
Tobacco.....lbs.	14	6	36	...	9,000	5,943	66	...

[1] Annual average of the five years 1911–15.

average value of which was $1.22 per bushel. The total value of the field crops of Canada in 1916 was estimated at $808,054,000 as compared with $841,297,500, the record of 1915. Consequently, the low yields of 1916 are to a large extent compensated for by the high prices prevailing.

Farm Live Stock.—The following were the estimated numbers of farm live stock in Canada on June 30, 1916, as compared with the same date in 1915:

	1915	1916
Horses.....	2,996,099	2,990,635
Milch cows.....	2,666,846	2,603,345
Other cattle.....	3,399,155	3,313,519
Sheep.....	2,038,662	1,965,101
Swine.....	3,111,900	2,814,672

Immigration.—For the fiscal year ended March 31, 1916, the total number of immigrant arrivals in Canada was 48,537, of whom 36,937 came from the United States, 8,664 from the United Kingdom and 2,936 from other countries. The corresponding total in 1915 was 144,789.

Railway Construction.—According to the official railway statistics of the Department of Railways and Canals for the year ended June 30, 1916, the total railway mileage of the Dominion (not including 2,300 miles under construction) was 37,430, an increase of 1,848 miles over the preceding year. During the same year $18,066,886 was added to the capital liability of the railways, bringing the total up to $1,893,877,774, of which $848,269,488 is represented by stocks and $1,045,608,286 by bonds. This does not include the liability attaching to mileage under construction.

Destruction of the Houses of Parliament.—A fire which broke out in the reading room of the House of Commons at Ottawa on the evening of Feb. 3 totally destroyed the Houses of Parliament and resulted in the loss of six lives and injuries to others who escaped with difficulty. The Dominion Houses of Parliament, completed in 1866, formed one of the finest examples of Gothic architecture on the American continent. The demolition of the ruins and the rebuilding of the Houses on the same site have actively proceeded during the year, under the control of a Parliamentary committee, according to plans providing for improved accommodation. On Sept. 1 the ceremony of laying the corner stone of the new buildings was performed by the Governor-General (H. R. H. the Duke of Connaught), the stone being that which was laid as the corner stone of the

original buildings on Sept. 1, 1860, by the Duke's brother, the Prince of Wales, afterwards King Edward VII.

The Bilingual Controversy in Ontario.—During recent years an educational controversy has turned upon the rights of the French-speaking population of Ontario to the use of the French language in the public schools. On Aug. 17, 1913, the Ontario Department of Education issued a "Circular of Instructions No. 17" providing that in what are known as English-French schools in Ontario the French language as a medium of instruction should not be used beyond Form I, except, on approval of the chief inspector, for pupils who were unable to speak or understand English. It was claimed by the opponents of the Circular that the rights of the French-speaking inhabitants under the British North America Act of 1867 were thereby infringed, and after legal decisions of the Canadian courts had been given against them, they carried an appeal to the Judicial Committee of the Privy Council in England. Judgment was pronounced by Lord Chancellor Buckmaster on Nov. 2 which dismissed the appeal and upheld the legal validity of the "Instructions" issued by the Ontario Education Department. Another appeal at the same time, contending that an Act of the Ontario Legislature (5 Geo. V, Ch. 3) providing for the appointment of a commission to conduct the English-French schools of the city of Ottawa instead of the elected board of trustees, was allowed, and the Act was pronounced *ultra vires*.

Prohibition Legislation. — During the past two years considerable progress in the direction of prohibition has been made in Canada by action of both the provincial and the Dominion legislatures. The Canada Temperance Act, a local-option measure, passed at the instance of the late Sir Richard Scott in 1878, prohibits the sale of intoxicating liquors in places that have adopted it, and at the present time it is in force in a number of counties and municipalities throughout Canada. In 1915 the Saskatchewan Legislature passed the Liquor License Act (6 Geo. V, Ch. 39) which prohibits the sale of liquor at all places other than stores established by the Act. A provincial referendum is to be taken not later than 1919 to decide if the system established by the Act shall be continued. The Hotel Act (6 Geo. V, Ch. 40) of the same province authorizes municipalities to appoint boards to consider questions of public accommodation, to license hotels and to remit taxes on hotels. No intoxicating liquors are to be kept or consumed in public hotels. In Ontario a Liquor License Act (5 Geo. V, Ch. 39) was passed in 1915; but in 1916 this Act was superseded by the Ontario Temperance Act (Ch. 50), which was assented to on April 27, and which prohibits the sale of intoxicating liquors in the province of Ontario. In 1916 the Dominion Parliament enacted a measure in aid of provincial legislation prohibiting or restricting the sale or use of intoxicating liquors. This Act makes illegal under penalties of fine or imprisonment the sending of intoxicating liquor into any province to be dealt with in violation of the law of that province.

Legislation of the Dominion Parliament.—The sixth session of the twelfth Parliament of Canada was held at Ottawa from Jan. 12 to May 18. Ninety-four statutes were enacted, 29 of them being public general acts and the remaining 65 being local and private acts. The Customs Tariff Amendment Act (Ch. 7) raises the import duties payable upon apples to 60 cents for the British preferential tariff and 90 cents for the intermediate and general tariffs. The duties previously in force were 25 cents, 35 cents and 40 cents for these tariffs, respectively. The Act also reduces the duties payable upon fuel oil, including heavy distillates used in traction engines, to ⅓ cent per gallon for the British preferential tariff and to ½ cent per gallon for each of the other two tariffs. Both items are made exempt from the special customs rates specified in the Customs Tariff War Revenue Act, 1915, section 3. Chapter 10 amends the Bank Acts by making permanent the authority to lend money to occupiers of land for the purchase of seed grain upon security of the crop grown, and also authorizes the banks to lend

money to farmers and stock owners upon the security of their live stock. The Act provides that in provinces where statutes or ordinances are in force relating to bills of sale and chattel mortgages, the security may be taken in the form of a bill of sale or chattel mortgage, valid and lawful according to the laws in those provinces. In provinces where there are no such statutes or ordinances in force, it is provided that the security may be taken in the form of a memorandum in the terms of a schedule to the Act, this memorandum to be published in the Official Gazette of the province within 30 days after its execution. The Business Profits War Tax Act (Ch. 11) imposes a tax of 25 per cent. of the amount by which the profits earned in any business exceed, in the case of a business owned by an incorporated company, the rate of seven per cent. per annum, and in the case where it is owned by any other person or association, the rate of 10 per cent. per annum upon the capital employed in the business. The Act applies to all trades and businesses carried on in Canada, with the following exceptions: (a) businesses the capital employed in which has been throughout the accounting period less than $50,000; (b) the business of life-insurance companies; (d) any business of which not less than 90 per cent. of the stock or capital is owned by a province or municipality. However, businesses are not exempt which are engaged in manufacturing or dealing in munitions, materials or supplies of war, nor are businesses exempt of which 20 per cent. or more in value relate to war materials or supplies. The Act contains provisions for the computation of profits, calculation of capital, collection of taxes and the hearing of assessment appeals. The Life Insurance Investment Act (Ch. 18) makes it obligatory upon Canadian life insurance companies licensed under the Life Insurance Act, 1910, to hold and own during the two years ending Dec. 31, 1917, securities of Canada to the amount of not less than 50 per cent. of the increase in the net ledger assets of the company, the object being to provide a market for the securities of Canada issued in consequence of the war. Chapter 21 amends the Prisons and Reformatories Act (R. S. 1906, Ch. 148) by making that Act applicable to the system of reformatories and industrial farms recently established by the provincial Government of Ontario. Provision is made in the Act for the transfer of prisoners from the jails to the industrial farms or for their transfer to jail where necessary. The Act also gives wider powers to the parole board established in connection with reformatories by the lieutenant-governor of Ontario in respect of the termination or suspension of indeterminate sentences. The Zinc Bounties Act (Ch. 27) provides for a bounty on zinc produced in Canada when the price in London, England, is less than £36 19s 3d per long ton. No bounty, however, is payable under the Act for zinc produced during the continuance of the war, nor for zinc produced after July 31, 1917. Acts relating to railways were passed as chapters 2, 17, 20, 22 and 23, and other statutes amended include the following: White Phosphorus Matches (Ch. 4), Winding Up (Ch. 5), Canada Grain (Ch. 6), Vancouver Harbour Commissioners (Ch. 9), Canada Shipping (Chs. 12 and 13), Dominion Forest Reserves and Parks (Ch. 15), Exchequer Court (Ch. 16) and Judges (Ch. 25). The 65 local and private acts included two incorporating railway companies (Chs. 30 and 31), 20 amending railway company acts (Chs. 32-51), two insurance company and two trust company acts (Chs. 52-55), 11 other company acts (Chs. 56-66), four acts relating to patents (Chs. 67-70) and 24 acts of divorce (Chs. 71-94). The company acts include two providing for the division of the governing body of the Salvation Army into two governing councils, one for Canada east and one for Canada west. Another of these acts provides for the amalgamation of the Kingston School of Mining and Agriculture with Queen's University.

By Act of the Imperial Parliament (6-7 Geo. V, Ch. 19), passed June 1, 1916, the life of the existing Parliament of Canada was extended until Oct. 7, 1917. It would otherwise have expired by effluxion of time on Oct. 7, 1916.

THE BRITISH EMPIRE

EDWARD PORRITT

THE UNITED KINGDOM

Parliament and the Franchise.—The British Parliament was in session during the greater part of 1916. When the year opened, the session which began on Nov. 11, 1914, was not yet at an end, and Parliament was not prorogued until Jan. 27, 1916. In accordance with the Parliament Act of 1911, this Parliament, which was elected in December, 1910, would have reached the limit of its existence on Jan. 30, but a few days before prorogation a bill was passed, which received the royal assent on Jan. 27, prolonging the life of the Parliament for eight months. It was thus continued to the end of September, 1916, and on Aug. 14 a second bill was introduced by which another period of eight months was added to its duration, making May 31, 1917, the limit of its existence.

There has been since the beginning of the war an insistent demand for a reform of the electoral system which should make the right to vote dependent on national service rather than on any form of property qualification. In introducing the bill of Aug. 14, Mr. Asquith pointed to the difficulties surrounding such a reform at that time. Was the age limit, he asked, to remain at 21? Where and how was the soldier to record his vote? Were there not most serious objections to a general election outside the United Kingdom among men actually engaged at the front? If there was a general enfranchisement on the principle of state service, what was the House to do with the women? In the face of these difficulties the question of electoral reform was postponed, and the bill provided only for the creation of a new register, to supersede the pre-war register then in service. The bill made no change in the qualifications for the franchise, but provided that men who had been on the old register should be put on the new one, if they had in the meantime lost their qualification through service as soldiers or sailors, as mine sweepers, ambulance workers, or munition workers, or in case they had been compelled to change their abode owing to the destruction of their houses by hostile bombardment or by order of the Government to make way for home-defense works. After many attempts to frame a workable measure the bill was dropped, and the matter was left to be dealt with by Parliament in the session of 1917.

The New Administration.—In December there was a complete reconstruction of the Cabinet. The change was due largely to the uneasiness felt in the country over the Rumanian reverses of November, 1916, and the large losses in shipping due to Germany's submarine activity, and to the discontent with what seemed like hesitation and want of firmness on the part of the Asquith Government in dealing with the questions of food shortage and high prices and also with the control of the liquor trade. Mr. Asquith was furiously attacked by the London *Times* and *Daily Mail*, the newspapers owned by Lord Northcliffe, and on Dec. 5 he tendered his resignation, which was accepted by the King. The King then summoned Bonar Law, the leader of the Unionist party, who was unable to form a Ministry, and the task was given to David Lloyd George, who by Saturday of the same week (Dec. 9) was able to announce the names of the new Ministers. One of the complaints that had been made was that the Cabinet was entirely too large, too much of a debating society, to be able to carry on the war effectively. It had been proposed by Lloyd George to Mr. Asquith before Mr. Asquith's resignation that a War Council should be formed, with uncontrolled power to direct all war operations; that this Council should consist of five members, and that Mr. Asquith should not be one of the five. This proposal was unacceptable in a form that excluded the Premier from responsibility; but in the reconstructed Ministry the plan was adopted of forming a War Council of five members, with Lloyd George, the new Premier, at its head. The War Council included also Earl Curzon, Lord President of the Council, and Government leader in the House

of Lords; Andrew Bonar Law, Chancellor of the Exchequer; Arthur Henderson, leader of the Labor party; and Viscount Milner. Henderson and Milner held no portfolios.

The Ministry as it stood before reconstruction and the new Ministry were as follows, the party affiliation of each member being indicated after his name:

Old Ministry		New Ministry
Herbert Asquith.....(L.)	Prime Minister and First Lord of the Treasury	David Lloyd George.....(L.)
Marquis of Crewe.....(L.)	Lord President of the Council	Earl Curzon.....(U.)
Reginald McKenna.....(L.)	Chancellor of the Exchequer	Andrew Bonar Law.....(U.)
Marquis of Landsdowne..(U.)	Without Portfolio	Viscount Milner.....(U.)
.....	" "	Arthur Henderson.....(Lab.)
Lord Buckmaster.....(L.)	Lord High Chancellor	Sir Robert B. Finlay.....(U.)
H. Samuel.....(L.)	Home Secretary	Sir George Cave.....(U.)
A. Bonar Law.....(U.)	Colonial Secretary	Walter H. Long.....(U.)
Viscount Grey.....(L.)	Foreign Secretary	Arthur J. Balfour.....(U.)
David Lloyd George.....(L.)	Secretary for War	Earl of Derby.....(U.)
Austen Chamberlain.....(U.)	Secretary for India	Austen Chamberlain.....(U.)
Walter H. Long.....(U.)	President of the Local Government Board	Baron Rhondda.....(L.)
Walter Runciman.....(L.)	President of the Board of Trade	Sir Albert Stanley.....
.....	Minister of Labor	John Hodge.....(Lab.)
A. J. Balfour.....(U.)	First Lord of the Admiralty	Sir Edward Carson.....(U.)
E. S. Montagu.....(L.)	Minister of Munitions	Dr. Christopher Addison...(L.)
Lord Robert Cecil.....	Minister of Blockade (War Minister of Trade)	Lord Robert Cecil.....(U.)
.....	Food Controller	Baron Devonport.....(L.)
.....	Shipping Controller	Sir Joseph Paton Maclay.....
.....	Minister of Pensions	George N. Barnes.....(Lab.)
Lord Selborne.....(U.)	Pres. of Board of Agriculture	Rowland E. Prothero.....(U.)
Marquis of Crewe.....(L.)	President of Board of Education	Herbert A. L. Fisher.....
Lewis Harcourt.....(L.)	First Commissioner of Works	Sir Alfred M. Mond.....(L.)
T. McKinnon Wood.....(L.)	Chancellor of the Duchy of Lancaster	Sir Frederick Cawley.....(L.)
J. A. Pease.....(L.)	Postmaster-General	Albert Illingworth.....(L.)
Sir F. E. Smith.....(U.)	Attorney-General	Sir F. E. Smith.....(U.)
Sir George Cave.....(U.)	Solicitor-General	Gordon Hewart.....(L.)
H. J. Tennant.....(L.)	Secretary for Scotland	Robert Munro.....(L.)
Robert Munro.....(L.)	Lord Advocate	James A. Clyde.....(L.)
Thomas B. Morison.....(L.)	Solicitor-General for Scotland	Thomas B. Morison.....(L.)
Baron Wimborne.....(U.)	Lord Lieutenant of Ireland	Baron Wimborne.....(U.)
Henry E. Duke.....(U.)	Secretary for Ireland	Henry E. Duke.....(U.)
Sir Ignatius O'Brien.....(L.)	Lord Chancellor of Ireland	Sir Ignatius O'Brien.....(L.)

The new Ministry included 12 Liberals, 15 Unionists, three members of the Labor party, and three men who were not attached to any party—the Presidents of the Board of Trade and Education and the Shipping Controller.

Conscription.—The most important question of domestic policy during the early part of 1916 was that of compulsory military service. At the close of 1915 what was known as the Derby scheme was still in operation (*A. Y. B.*, 1915, p. 142). Under this scheme, while there was no compulsory military service, the strongest possible pressure was brought to bear to get all men of military age to attest. At the end of Lord Derby's campaign it was estimated that there were still in Great Britain over 600,000 single men of military age who had not attested, and in fulfilment of a pledge given by the Prime Minister to the married men who had attested, that they should not be called up while any large number of single men were left behind, a bill for the conscription of single men was introduced in Parliament on Jan. 5. The chief provisions of the bill were as follows: (1) Unattested single men and childless widowers of military age (that is, who were between the ages of 18 and 40, inclusive, on Aug. 15, 1915) were to be treated as though they had attested under Lord Derby's group system. (2) Service was to be for the duration of the war. (3) Men were not to be called up for service until the 21st day after the day on which the Act came into force (the date afterwards fixed was March 1). (4) Three appeal tribunals were designated to deal with claims for exemption. (5) Ministers of religion and men rejected later than Aug. 1, 1915, were exempted altogether. (6) Exemption was allowed to men employed in necessary national work; men who were the sole support of

dependents; men physically unfit; and men who conscientiously objected to combatant service, in which case the exemption might be given from combatant military duty only. The bill passed its third reading in the House of Commons on Jan. 24 by a vote of 383 to 36. Under its provisions 750,000 single men were added to the 1,150,000 who had attested under the Derby scheme. Of these about 300,000 were passed into the Army, as against 343,386 passed for combatant service under the voluntary enlistment of the Derby scheme. Ireland was not included in the bill.

Later in the year it was realized that if Great Britain was to win the war, more soldiers would be necessary, and the House of Commons held a secret session at which Mr. Asquith and the other Ministers explained the needs of the army and laid before the House a scheme of general military service. The bill in which the new proposals of the Government were embodied was introduced in the House of Commons on May 4, and completed its Parliamentary stages on May 24. Under the provisions of this Act, all males between the ages of 18 and 41, married or single, were subjected to compulsory enlistment in the army. Every boy came under the operation of the law as soon as he reached the age of 18. The law also provided that all men who had served in the army and whose time had expired were recalled if they were under the age of 41 at the time the Act was passed. An exemption for two months was allowed men engaged in industries of national importance, and it was provided that men engaged in civil work of national importance might be formed into a special reserve to be called upon for duty if required. In explaining the necessity for the bill, Mr. Asquith stated that the army had been increased since the beginning of the war from six regular and 14 territorial divisions, with the addition of six overseas divisions, making altogether 26 divisions, to 42 regular and 28 territorial divisions, making 70 divisions in all. The Naval Division increased this total to 71, and twelve divisions from the Dominions made it 83. The total military and naval effort of the Empire, Mr. Asquith added, was represented in a number which exceeded five million men. In the House of Commons the bill obtained a majority of 292. In the House of Lords it was passed without division. The military tribunals which were legalized by the first Military Service Act were established in every recruiting area. They were nominated by the local authorities and were composed of men prominent in the locality, when possible representing the interests of employers and workers, who served without pay. Appeal tribunals were also set up whose duty it was to review cases which were appealed from the local tribunals, whether these cases were due to questions of personal hardship, of conscientious objection, or of work of national importance for which the men coming before the tribunals were needed. The cases of conscientious objectors, which attracted considerable attention, formed about two per cent. of the cases coming before the tribunals. A military representative watched the interests of the army before each of the tribunals.

Munitions.—There was no such difficulty in regard to the supply of munitions in 1916 as faced the Government in 1915 (*A. Y. B.*, 1915, p. 140). The workers showed their patriotism by foregoing their Whitsuntide holiday and continuing their work under the promise of two days in August instead. In July, when the August bank holiday was approaching, another appeal was made, this time from Gen. Sir Douglas Haig, the Commander-in-Chief, asking the workers "to forego any idea of a general holiday until our goal is reached." The appeal met with a quick and generous response. The representatives of the organized trades, including both men and women engaged on munitions work, sent a message to General Haig assuring him that there would be no relaxation of effort and that they would recommend the postponement of all holidays, general and local, which would involve interruption of production, until such time as they had assurance from him that military exigencies would permit of the postponed holidays being taken.

Speaking in July, Frederick G. Kellaway, Parliamentary Secretary to

the Ministry of Munitions, stated that there were then nearly 4,000 controlled plants producing munitions. Of these 95 per cent. had never made a gun, a shell or a cartridge before the war. In addition to these establishments, there were the government arsenals and armament shops which existed before the war and 90 new arsenals which had been built or adapted, almost all of which were producing heavy guns, howitzers, big shells or explosives. The number of war workers at the end of 1914 was 1,986,000, including 184,000 women. In July, 1916, the number was 3,500,000, of whom 660,000 were women. Women were engaged on 471 munition processes, including 19 operations in connection with aeroplane production, the manufacture of howitzer bombs and shrapnel bullets, filling bombs with smoke, explosives, gas and other lethal contents, 31 processes in the production of machine tools, six in connection with marine mines, and 31 in shipbuilding. Two-thirds of these operations had never been done by a woman up to June, 1915. During the later months of 1916 the number of women was greatly increased, women being called upon to liberate men for active service.

Finance.—The budget for the fiscal year ending March 31, 1917, was submitted to the House of Commons by Mr. McKenna, Chancellor of the Exchequer, on April 4. On Feb. 21 the Government had asked the House of Commons for a vote of credit of £420,000,000, £120,000,000 of which was needed to complete the current financial year and £300,000,000 for the ensuing year. In asking for this vote of £120,000,000, Mr. Asquith stated that the total votes of credit for the year 1915-1916 would amount to £1,420,000,000 and the total votes of credit since the war began to £1,782,000,000. On Nov. 7, 1915, he had estimated the expenses of the war at £5,000,000 a day. Since then the war had cost £389,000,000, or between £4,300,000 and £4,400,000 a day, and there remained in hand out of the sums voted by Parliament £102,000,000. Up to Feb. 19 the loans to the Allied powers and the Dominions had amounted to £168,900,000, and liabilities had been incurred by the Bank of England at the request of the Government in respect of these advances which had not yet been repaid, and which would be discharged out of the vote of credit. This liability was therefore not included when he made his last statement of war costs.

The proportion of this expenditure which was raised by taxation and the amount paid out of loans were set forth by Mr. McKenna in his budget speech of April 4. The total revenue for 1915-16 had been £337,000,000, and the total expenditures £1,559,000,000. The deficit was therefore £1,222,000,000, which had been made good by borrowing. £600,000,000 was raised by the war loan issued in June, 1915; £154,000,000 was obtained by the sale of Exchequer bonds; £50,000,000 was raised by the Anglo-French loan in America, and the balance by the sale of Treasury bills.

Summarizing the situation in regard to the national debt, Mr. McKenna stated that the pre-war debt stood at £651,000,000. In 1914-15 the debt was increased by £458,000,000; and in 1915-16, by £1,031,000,000, after allowing for the effect of conversion. On March 31, 1916, the last day of the fiscal year, the debt stood at £2,140,000,000, of which £368,000,000 had been advanced to the Allies and Dominions. The charge on this debt for a full year would be £95,000,000.

The revenue for 1915-16 had surpassed the estimates by £32,000,000, the excess being due chiefly to increased income tax, supertax, customs and excise. The excess-profits tax for 1915-16 had not been collected, but there had been forestalments of revenue properly belonging to 1916-17 of about £7,000,000. The expenditures for the fiscal year 1916-17, Mr. McKenna estimated, would amount to £1,825,000,000, or almost exactly £5,000,000 a day. The distribution of this money was given as follows:

War services, including army, navy and munitions	£1,120,000,000
Advances to Allies and Dominions	450,000,000
Consolidated Fund services and interest on debt	138,500,000
Civil service, customs, excise and internal revenue	60,000,000
Post Office	27,000,000
Miscellaneous expenditure on the war	30,000,000

Deducting the estimated advances to the Allies and Dominions, the expenditures for the year would be at the rate of £3,750,000 a day. The revenue for the coming year Mr. McKenna estimated at £502,275,000, leaving a deficit of £1,322,750,000, which would have to be made good by borrowing. Reckoning the interest charge at five per cent. and a sinking fund of one per cent., a sinking fund that would pay off the debt in 37 years, the new debt would entail a new charge for interest and sinking fund of £79,000,000.

New taxes were proposed by Mr. McKenna which would bring in for the year 1916-17 about £72,950,000. The principal additions to taxation included increases in the income taxes ranging from 1 4/5d. on earned incomes under £500 a year to 1s. 6d. on incomes over £2,000 a year. The supertax on incomes over £8,000 a year, which is charged in addition to income tax, remained unchanged at rates ranging from 2s. 10d., on incomes between £8,000 and £9,000, to 3s. 6d. on incomes over £10,000. Motor car licenses were doubled on cars of lower horse power and trebled on those of over 33 h.p., a 60-h.p. car being charged a license duty of £126 0s. 0d. New taxes were levied on tickets or entrance fees charged for places of amusement and on railway tickets. A tax of 4d. per 1,000 was laid on matches; there were additions to the taxes on sugar, cocoa, coffee and chicory; and the duty on excess war profits was raised from 50 to 60 per cent.

Up to the end of November three votes of credit for expenditures for the fiscal year 1916-17 had been asked from Parliament in addition to the vote of £300,000,000 asked on Feb. 21. They were for the following amounts: £300,000,000 on May 23; £450,000,000 on July 24; and £300,000,000 on Oct. 11, making a total for the eight months from April 1 to Nov. 30, of £1,350,000,000. Exchequer bonds, repayable at par on Feb. 16, 1920, were issued in September. The price of the issue fixed by the Treasury was £100 per cent. and the interest six per cent.

Commerce.—The policy of restricting imports which was begun in 1915 was continued through 1916. This policy had two aims, (1) the releasing of cargo space on vessels for imports which were essential for the feeding of the nation and the carrying on of the war; and (2) the redressing of the huge adverse balance of trade due to enormous importations of munitions of war. Just before the prorogation of Parliament on Jan. 27, Mr. Runciman, President of the Board of Trade, announced the appointment of a committee, with Lord Curzon as chairman, whose duty it should be to assume control of mercantile tonnage. In order to reduce the bulk of imports the following commodities were selected, the importation of which could be made only under licences granted by the Government: paper pulp and grass for paper making; raw tobacco; certain building materials, including stones and slates; furniture woods and veneers; some fruits; all periodicals of over 16 pages imported in bulk, only single copies by mail to be admitted; sugar; commercial cars; vacuum cleaners; and yeast.

Customs duties on motor cars, musical instruments, clocks and watches and motion-picture films had been imposed in 1915 with a view to checking imports, and so redressing the balance of trade. No change was made in these duties in the Finance Act of 1916, but the duties had little appreciable effect on the adverse balance of trade. It was noticeable, however, that there was a large increase in the value of British exports, an increase which was both absolutely and relatively greater than the increase in the value of imports. The balance of trade in 1916 was consequently less adverse than in 1915. The Board of Trade in November published the trade returns for the ten months ending Oct. 31. These showed that the adverse balance of trade for the ten months, leaving out of account the movements of bullion and coin, was £276,500,000, as against £313,250,000 for the corresponding ten months of 1915, a decrease of the adverse balance of 36¾ millions sterling. The figures are as follows:

	1916	1915	1914
	£	£	£
Imports...	784,996,180	711,634,539	573,791,657
Exports...	424,044,186	315,060,651	379,350,069
Re-exports	84,538,401	82,782,519	83,976,069

Part of the increase in both imports and exports was due to the rise in prices, but there were also considerable increases in quantities, both in imports and exports. Imports of raw cotton increased by 165,479 centals; wheat increased by 2,901,300 cwts.; beef by 161,349 cwts.; and bacon by 182,315 cwts. Imports of paper fell by 688,237 cwts., and in value by £195,281. Among exports, manufactures of textiles advanced in value by £4,603,821, exports of cotton piece goods being increased by 18,906,700 yds., woollen goods by 3,732,109 yds., jute goods by 3,683,500 yds., and linen goods by 205,400 yds.

Trade Policies of the Allies.—There was much discussion during 1916 of the trade policy to be followed by the Allies after the war. As early as January, the chambers of commerce of the United Kingdom and of the Empire were considering a programme which included the adoption of a system of preferential tariffs within the Empire; the question of preferential trade relations between the British Empire and the Allied nations; the measures which should be taken within the Empire against enemy countries in respect of manufactured goods and shipping; the amendment of the laws relating to naturalization; and the prohibition of contracts with aliens which might have the effect of restraining imperial trade. The great majority of the chambers of commerce endorsed proposals looking to the giving up of the British free-trade system, and in March the board of directors of the Chamber of Commerce of Manchester, which had clung to the old free-trade doctrine, was obliged to resign, as it found itself out of sympathy with the majority of the members of the Chamber, and a protectionist board was elected to take its place.

A conference of the Allies was held in Paris on March 27. The object of this conference was to secure unity of action in regard to the war, but the subject of economic policy was then brought up, and it was resolved that the Allied Governments should put into practice, in the economic domain, their solidarity of views and interests. The measures necessary for the carrying out of this resolution were referred to an economic conference to be held in Paris later in the year. This economic conference was held on June 14-17. It drew up three sets of recommendations; one set for the period of the war; the second for the period of reconstruction at the end of the war; and the third as permanent measures of mutual collaboration among the allies. In brief, the conference recommended: (1) for the war period, the coördination of the laws and regulations in the Allied countries prohibiting trading with the enemy; an absolute embargo on the importation of goods coming from enemy countries; sequestration or control of businesses owned or operated by enemy subjects, and stringent measures for the restriction of enemy supplies; (2) for the reconstruction period; the devising of joint means to secure to countries suffering from acts of destruction or unjust requisition, the restoration of their raw materials, industrial and agricultural plant, stock and mercantile fleet, or to assist them to reëquip themselves in these respects; denial to the enemy powers, for a period to be fixed by agreement, of most-favored-nation treatment; conservation of, and interchange between, the Allied countries, of their natural resources; and protective measures against enemy dumping and against enemy subjects in Allied countries engaging in industries important for national defence or economic independence; and (3) for the peace period, measures to be taken to render the Allied countries independent of the enemy countries in raw materials and manufactured articles essential to the normal development of their economic activities; to facilitate and improve the exchange of their products, and to assimilate their laws governing patents and trade marks and literary and artistic copyright. With the British representatives at this conference were W. M. Hughes, Prime Minister of Australia, and G. E. Foster, Minister of Trade and Commerce of the Dominion of Canada. (See also III, *International Relations*.)

Domestic Control of Commodities.—The great and general rise in prices of all the necessaries of life in the summer of 1916 gave rise to much restlessness among the people and un-

easiness on the part of the Government. On Sept. 17 a departmental committee was appointed by the Board of Trade to investigate the principal causes which had led to the increased cost of commodities of general consumption since the beginning of the war. The committee made an interim report on Sept. 29. In this report it recommended the hastening of naval construction to supply the shortage of mercantile ships; that sufficient men should be released from military duty to carry through the dock and railway work necessary in connection with food imports; that the government policy of restricting less important imports should be carried further; that the slaughtering of breeding stock should be restricted; that the Government should develop sources of supply from which it could make direct purchases of meat; that the Government should impose restrictions on wholesale and retail prices; that the people should institute one meatless day each week; that economies should be effected in supplying meat to the armies without lessening the rations of individual soldiers; that fair and adequate wages should be paid in all controlled establishments; that employers be urged to revise their payrolls with a view to paying a living wage; and that municipal shops for the sale of food be established. Much discussion of the report followed, and the creation of a government department for the control of the food of the nation, with maximum prices for the chief commodities, was proposed. In December, after the appointment of Lord Devonport as food controller, orders were issued fixing a maximum price for the sale of potatoes and forbidding the use, after Jan. 1, 1917, of white flour.

There was also a powerfully backed movement in favor of the suspension of the liquor traffic during the war, as a means of conserving the food and the financial strength of the nation. A memorial to the Government signed by 27 admirals and 51 generals, as well as by privy councillors, members of Parliament, directors of munitions, and men of importance in university life, in finance and industry, and in science, medicine and public health, was presented to the Government at the close of the year; but in spite of the strong movement against it, the only restrictions placed on the liquor trade in the course of the year were regulations limiting the hours during which intoxicants could be sold in licensed houses.

Ireland.—From the beginning of the war there had been complaints that the Irish were not taking their fair share of military service. It had not been considered politic to extend to Ireland the provisions of the Act of January for forced military service on the part of single men (see *supra*). Nevertheless, little uneasiness had been felt concerning Irish loyalty, and the country was taken completely by surprise at the end of April when a short-lived rebellion broke out in Dublin. On Good Friday, April 21, a German submarine, the *U-19*, conveyed Sir Roger Casement and a few companions, with a small load of arms, to Banna Strand on the coast of Kerry. There they were placed in a collapsible boat which was rowed ashore. Almost immediately after landing Sir Roger Casement was taken prisoner. There was no organized body of men to meet him or to take advantage of the arms he brought. Three days later, on Monday, April 24, a disturbance broke out in Dublin. Bands of rebels took possession of the post office, where the telegraph and telephone wires were cut, the law courts, two railway stations, Stephen's Green, and a number of houses in Sackville St. An ineffective attack was made on the Castle, but was abandoned on the arrival of soldiers from the Curragh. Fighting continued throughout the week, martial law in the city and county of Dublin being proclaimed on the 25th. On the 26th the rebel base at Liberty Hall was destroyed and cordons of troops surrounded the center of the city. There were risings on this day at Ardee, Swords and Lusk, and on the 27th, General Maxwell left for Ireland with plenary powers. Martial law was proclaimed throughout Ireland, and centers of disturbance in Galway, Enniscorthy, Killarney and Clonmel were quieted by the appearance of fresh troops. On the 29th, the Dublin post office was destroyed,

and the following day, Sunday, April 30, the rebels surrendered. During the fighting in Dublin, 180 civilians were killed and 614 wounded. The number of rebels punished for their share in the rebellion was as follows: executed, 14; sentenced to death but not executed, two; penal servitude, 73; imprisoned with hard labor, six; deported, 1,706. Among the men who were killed was Sheehy Skeffington, who was not among the rebels but who was shot by order of a military officer afterwards found to be insane. Sir Roger Casement was hanged on Aug. 3. A Royal Commission of Inquiry into the rebellion in Ireland was appointed early in May, with Lord Hardinge as chairman. In its report the Irish Secretary, Augustine Birrell, was sharply criticized for his neglect of numerous indications of dangerous sedition. The Lord Lieutenant, Lord Wimborne, was acquitted of responsibility for the rebellion, and the Under-Secretary for Ireland, Sir Matthew Nathan, was also exonerated. After the report of the Commission, Mr. Birrell resigned his post, and in August Mr. Duke, K.C., a Unionist member of Parliament, was appointed in his place, greatly to the discontent of the Irish Nationalists, who strongly objected to the restoration of Dublin Castle rule with a Unionist executive.

Between May and August, an abortive effort was made to bring the Home Rule bill into immediate operation. A compromise providing for the temporary exclusion of Ulster and the continuance of the Irish representation at Westminster was arranged by Mr. Lloyd George and accepted by both Mr. Redmond for the Nationalists and Sir Edward Carson for the Unionists. It was rejected, however, by the House of Lords, which insisted that the exclusion of Ulster should be permanent and that the Irish representation in the Imperial Parliament should be immediately reduced. These further concessions the Nationalists refused to make, and the bill embodying them failed. No attempt was made to include Ireland under the second Military Service Act of May 24, under which all males, married and single, were made liable to military service.

THE OVERSEAS DOMINIONS[1]

India.—The term of Lord Hardinge as Viceroy of India expired in 1915, but his return was delayed for six months, because it was felt inadvisable to make a change until a more settled condition was reached after the disturbances which had occurred in India at the outbreak of the war. In the first year of the war, Lord Hardinge had sent an army corps to Mesopotamia to help in the campaign which afterwards had as its object the relief of Kut (see *The European War, infra*). He also sent large forces to Egypt for the defence of the Suez Canal; a substantial expedition to East Africa; garrisons to Mauritius and Singapore; an Indian battalion to Cameroon; a force to southern Persia; and a detachment to assist the Japanese at Tsing-tau. Besides thus sending Indian forces over half the globe, Lord Hardinge had to provide for the defence of Aden and of the northwest frontier, where there were seven minor outbreaks in the first 18 months of the war.

The Indian budget brought in at the beginning of March, shortly before Lord Hardinge's departure, showed remarkable financial strength in spite of the heavy calls for war expenses. There was a deficit of £2,750,000, but this was much less than had been estimated in 1915, when it had been proposed to borrow £6,500,000 in London and to renew the whole of the temporary debt. In fact, the Indian Government had borrowed in London in the year 1915-16 only £3,500,000, and had discharged £4,000,000 of the temporary debt. The revenue from the customs fell off considerably during the fiscal year, but there were much larger receipts from the Government railways, which more than made good the loss in import duties. For the year 1916-17, it was proposed to raise the general import tariff from five per cent. to 7½ per cent.; to lay small export duties on jute and tea; to abolish the free list and to lay an import duty of 10 per cent. on sugar. The income tax also was increased, making the highest

[1] Except Canada, covered in a separate article *supra*.

rate 1s. 3d. in the pound. The changes were estimated to bring in £3,500,000 of fresh revenue in the year 1916-17. Indian loyalty during the war manifested itself in munificent donations from the native princes and nobles. Among those received in 1916 were an armored aeroplane; a convalescent home for officers from Mesopotamia; ten motor ambulances; an armed motor launch; a convalescent hospital at Datia; six transport carts; and a laboratory launch.

On March 20 Lord Hardinge announced in the Legislative Council that it was the intention of His Majesty's Government to abolish the system of Indian indentured labor in Jamaica, Trinidad, British Guiana, Fiji and Dutch Surinam.

Lord Hardinge was succeeded as Viceroy by Lord Chelmsford, who at the beginning of the war had rejoined the army as captain. His regiment was detailed for duty in India, and he served there until he was appointed Viceroy. From 1905 to 1909 Lord Chelmsford was governor of Queensland, and from 1909 to 1913 of New South Wales.

Australia.—The year 1916 in Australia showed a gradual recovery from the effects of the severe drought of 1914-1915. The effects of the drought in the reduction of the flocks and herds is indicated by the exports of wool and meat for the year ending June 30, 1916. In the year 1913-14 the exports of wool amounted to 631,000,000 lb.; in 1915-16 they fell to 488,000,000 lb. For meat the figures were as follows:

	1913–14	1915–16
Beef	251,357,525	113,298,881
Mutton and lamb	197,236,908	38,343,628

In consequence of this falling off of exports and of an increase in imports consisting largely of war supplies, there was an adverse balance of trade in 1916 of £2,471,207, as compared with a favorable balance in 1914 of £2,409,589. Only in two previous years since the century opened had there been an adverse trade balance—in 1913, when the balance against Australia was £1,766,066, and in 1915, when it was £3,839,261. In 1907 the favorable balance amounted to over £24,000,000. Gold and specie exported amounted to £10,633,371, as compared with £2,730,389 in 1914-15. The drought was broken before the end of 1915, and in the closing months, the farmers, in response to patriotic appeals, put over 50 per cent. more acreage into wheat than in the preceding year. In consequence, in April, 1916, after the crop had all been harvested, there was a surplus of 3,500,000 tons over the domestic demand, for which it was extremely difficult to find cargo space for shipment to Great Britain. It was estimated that the crop was 2,000,000 tons in excess of that of 1915, but the high cost of carriage and the difficulty of obtaining ships prevented the British from obtaining the full advantage of the extra crop, and discouraged the farmers from further extensions of the wheat area.

According to the budget which was submitted to the Australian Parliament in October, the expenditures for the year were £91,000,000, including £41,200,000 spent on the army and navy. The war bill for 1916-17 was estimated at £85,300,000, and the total expenditure at £128,000,000. Owing to the increase in the cost of living, it was found necessary to raise the old-age pensions from 10s. to 12s. 6d. a week, and a provision of £1,000,000 was made in the budget for war pensions. For 1915-16 the revenue from taxation was £30,600,000, the remainder of the expenditures being defrayed out of loans. For 1916-17 it was estimated that the taxes would produce £39,000,000, and that £89,000,000 would have to be raised by loans. The income tax, which was levied in 1915 at the rate of 3d. in the pound, was raised to 4½d., and the limit of exemption for single men was reduced to £100, leaving it at £156 for married men, with the extra exemption of £26 for each child under 16. Taxes were laid on theater and amusement entrance charges, and a war-profits tax of 50 per cent. on all profits of the year 1915-16, and for 1916-17 of all war profits over 7 and 8 per cent. with an exemption of £200.

The chief political event of the year was the vote on the question of ex-

tending compulsory military service, which was demanded only for home defence, to the raising of troops for the war in Europe. William M. Hughes, the Premier, was in England in the early part of the year and his speeches in favor of imperialism and preferential trade within the Empire were received with immense enthusiasm. In June he was one of the representatives of Great Britain at the Economic Conference in Paris, and on his return to Australia he began a campaign in favor of conscription. Mr. Hughes was at the head of a Labor Government, but organized labor showed itself strongly adverse to the conscription proposals, and the bill submitting the question to a vote of the electors was passed in September chiefly by the votes of his political opponents, the Liberals. The vote was taken on Oct. 28, and resulted in a majority against conscription of 73,000 in a total vote of 2,087,000. In October Government figures showed that 103,000 men had enrolled voluntarily, and that 100,000 more men were needed before July 1, 1917.

Other Colonies. — South Africa throughout 1916 persevered with the task of driving German rule from the African continent. In domestic matters the Ministry, which received a new lease of power as a result of the elections of October, 1915, continued the policy of coöperation and support of the Imperial Government adopted at the outbreak of the war.

The New Zealand contingents, known, along with the Australian troops, as Anzacs, were kept to their full strength by reinforcements from the colony, and several times in the year won special praise for their valor and resourcefulness.

From Newfoundland, it was stated by Mr. Bonar Law in September, more men in proportion to population had entered the navy and army than from any other part of the Empire. Newfoundland profited in one respect from the trade restrictions on imports. As preference was given to the supplies of paper and wood pulp from British colonies in the issuance of licences for imports, Newfoundland in 1915-16 supplied 44 per cent. of the total imports. In 1913 the supply from Newfoundland was only 17.4 per cent. of the imports of paper into the United Kingdom.

CONTINENTAL EUROPE AND ASIA

Parker Thomas Moon

AUSTRIA-HUNGARY

Cumulative evidence of discontent in the Dual Monarchy was afforded by the trend of events in the year 1916. In Austria the exorbitant prices of food continued to excite complaint, even after the establishment of a more thoroughgoing system of state control, with maximum prices and with three "meatless days" a week. Through indirect channels the outside world received news of bread riots in Vienna. Socialist protests were stifled by an unrelaxing censorship; freedom of speech was cautiously curtailed; and by obstinately refusing to convoke either the Austrian Parliament or the Austro-Hungarian Delegations, the Government evinced its determination to override all opposition. Deprived of legal political means of manifesting displeasure, malcontents perforce resorted to violence. On Oct. 21 the Austrian Prime Minister (since 1911), Count Karl Stuergkh, while dining in a Vienna restaurant, was fatally shot by a Socialist, Dr. Friedrich Adler, editor of *Der Kampf*, who confessed a deliberate intention of using the assassination as a protest against Stuergkh's refusal to call the Parliament. Count Stuergkh's successor, Dr. Ernest von Koerber, had ably presided over the joint Austro-Hungarian department of finance since February, 1915. The Cabinet formed by Dr. von Koerber on Oct. 28 failed to discover a satisfactory solution of either the Austrian parliamentary question or the question of Austrian economic relations with Hungary, and resigned on Dec. 13, after holding office less than seven weeks. On Dec. 20, Minister of Agriculture Count Clam-Martinez was sworn in as Premier, with the following Cabinet: Premier, Count Clam-Martinez; Interior, von Hande; Commerce, Dr. Urban; Labor, von

Trnka; Education, Baron von Hussarek; Agriculture, Count Clam-Martinez; National Defense, F. von Georgi; Finance, Alexander Spitzmueller; Justice, von Schenck; Railways, Dr. Z. von Forster; without portfolio, Dr. Baernreither; Governor-General of Galicia, Michael Bobrzynski. Toward the close of the year a movement was set on foot to form a coalition of the German groups in the Austrian Parliament, including the Social Democrats, the Christian Socialists, and the German National Union.

Quite different was the situation in Hungary. The shortage of food was less serious, thanks to Hungary's prudent policy of obstructing the exportation of Hungarian grain to Austria. The Hungarian Parliament, more fortunate than the Austrian, enjoyed its ordinary powers and manifested surprising boldness in criticizing the Government. The debates in the Hungarian House of Representatives became vehement in June, when the Russian armies once more resumed their march westward. In a series of spirited speeches, Stephan Rakovsky and Count Michael Karolyi accused the Government of permitting Hungarian troops to be used in an ill-advised offensive against Italy (see *The European War, infra*), while Hungary was left without adequate defense against the Russian invader. In token of their dissatisfaction, Count Michael Karolyi, Count Julius Andrassy, Count Albert Apponyi, and other opposition leaders voted against the provisional budget, June 20. In July, by consenting to take the opposition leaders into his confidence regarding the purpose and conduct of the war, the Hungarian Premier, Count Tisza, purchased a temporary abatement of criticism; in August, however, the Government was subjected to new attacks by Andrassy, Apponyi, Rakovsky, and Karolyi; Count Karolyi in particular, as the leader of a new "Independence party," advocating the complete independence of the Hungarian army, the democratization of the Hungarian Government, and the speedy conclusion of peace, assailed the Premier at every opportunity. The entry of Rumania into the war, in the last week of August, was hailed by the Hungarian opposition as a fresh proof of the Government's incompetence. In a stormy sitting, Sept. 5, Karolyi and Andrassy urged the establishment of a coalition Cabinet and the convocation of the Delegations. Tisza, however, stood firm against all assaults; he warmly defended Baron Burian's conduct of foreign affairs, Sept. 14, and asserted that Rumania, under pressure of the Entente's solicitations, had acted with unexpected precipitancy. The creation of a new central department for the control of the food supply was announced about the end of September, and Parliament was prorogued to Dec. 7.

The death of the aged Emperor-King Francis Joseph I, on Nov. 22, brought to a close one of the longest and most eventful reigns in modern history, spanning the gap from the downfall of Metternich in 1848 to the great war. Francis Joseph was succeeded by his 29-year-old nephew, the Archduke Charles Francis, who assumed the imperial title as Charles I (Charles IV of Hungary) and was crowned king of Hungary at Budapest on Dec. 30. A month after his accession, Charles I appointed as Austro-Hungarian Foreign Minister Count Czernin von Chudenitz, a Bohemian nobleman and a friend of former Foreign Minister Count Berchtold. Baron Burian, the retiring Foreign Minister, was transferred to the Department of Finance in the Austro-Hungarian common Ministry.

FRANCE

The legislative session of 1916 in France, which began on Jan. 11, was characterized by the persistent endeavor of the Radical-Socialist and Socialist factions in the Chamber of Deputies to obtain from the Ministry complete confidential information regarding military and diplomatic affairs and to remind the Cabinet of its constitutional responsibility to the national legislature. The complaint, already familiar, that too much power had been confided to the general staff, was again put forward on Feb. 18, but M. Briand, as *président du conseil*, refused to discuss the ques-

tion and called for a vote of confidence; he was upheld by a majority of 394. Finally, in June, after several annoying outbursts of criticism, M. Briand conceded the parliamentary demand for a secret sitting in which the military situation might be fully revealed and frankly discussed. After seven days in secret session, an uncomfortably large minority of 97 deputies remained unconvinced and cast their votes against the Government on a motion of confidence, June 22; the majority (440), however, upheld the Ministry. At the same time the Chamber expressed its determination, while abstaining from intervention in the conduct of military operations, to exercise a more effective supervision of industrial and military preparation. The Senate held similar secret sittings on military affairs and subsequently gave the Government an overwhelming vote of confidence.

While in the Chamber of Deputies several Socialists persistently harassed the Ministry, the great majority of the Socialist party patriotically supported what it conceived to be the just cause of France in the war against Germany; indeed, Socialist criticism of the Government was chiefly on the score of inefficiency or laxity in the conduct of the war. So loyal, in fact, was the national council of the Socialist Party that on April 9, by a vote of 1,996 to 960, it even condemned a proposition to resume relations with the Socialist parties of enemy countries. In October the Unified Socialists with only three exceptions signed a declaration approving the vote of war credits and promising every effort to regain Alsace-Lorraine. The Congress of the Syndicalist Confédération Générale du Travail in May, 1916, like the Congress of the Socialist party in December, 1915, showed a majority in favor of supporting the Government, with an outspoken minority in favor of resuming the class struggle and reconstructing the International. (See also XV, *Socialism.*)

While plans for the reconstruction of French industry and agriculture after the war received thoughtful consideration, more earnest attention was devoted to the urgent problem of defraying the current expenses of war. Credits of 8,172,817,367 francs were voted for the first quarter of 1916; 7,817,000,000 for the second quarter; 8,511,000,000 for the third; and 8,838,000,000 for the fourth, bringing the total since August, 1914, to more than 61,000,000,000 francs. The bulk of this huge sum was raised by the sale of Government bonds. The great five per cent. "loan of victory" issued in 1915 stood at 90 on the Bourse when in September, 1916, M. Ribot obtained permission to issue a second five per cent. loan. The new loan was redeemable in 15 years and was issued at a price of 87¼. In November M. Ribot announced that the loan had brought in 11,360,000,000 francs, of which 54½ per cent. was new money (*argent frais*). Even to pay interest on the enormous war debt would require a very considerable increase of the ordinary revenues of the state; toward securing this increase a small beginning was made by the new taxes which M. Ribot proposed in May, including taxes on war-profits, dogs, automobiles, billiard tables, and hunting preserves, as well as heavier imposts on alcoholic beverages and on sugar and a larger tax on incomes. The ability of France to bear such burdens may be judged from the Finance Minister's statement that incomes totaling almost three billions of francs had been declared by 163,000 persons, in conformity with the new income-tax law, which had been promulgated July 15, 1914, and brought into operation by administrative decree, Jan. 15, 1916.

With health broken by the burden of arduous duties, War Minister Galliéni resigned on March 16, about two months before his death; he was succeeded at the war office by Gen. Pierre Auguste Roques.

A bill to postpone all legislative, departmental, cantonal and municipal elections during the war was promulgated as the law of April 15, 1916. In October a law was enacted providing bounties for the encouragement of wheat growing. Criticism of the railway administration became so insistent in November that Premier Briand appointed Albert Claveille director-general of transportation and importation, with supervisory powers over all public carriers.

A new parliamentary crisis arose in December, when, after an important secret deliberation, the Chamber of Deputies voted an order of the day (Dec. 7) calling for a reorganization of the high command. With bold statesmanship M. Briand on Dec. 12 effected a sweeping reorganization not only of the high command but of the Cabinet as well. Control of the war services was concentrated in a War Council of five members, including M. Briand himself, as Premier and Foreign Minister, Alexandre Ribot as Finance Minister, Gen. Hubert Lyautey as War Minister, Rear-Admiral Lacaze as Minister of Marine, and Albert Thomas as Minister of *Fabrication National*, i.e., industry, munitions, and transportation. The Cabinet included besides the above-mentioned ministers, Louis Malvy (interior), Paul Painlevé (public instruction), Etienne Clementel (commerce and agriculture), M. Herriot (labor and national subsistence), Gaston Doumergue (colonies), and René Viviani (justice and public works). The number of ministers was thus cut down from 22 to 11. Technical experts were appointed as under-secretaries. The office of commander-in-chief of the armies was abolished, General Joffre being nominated "technical adviser to the Government" on Dec. 13 and then being retired, a fortnight later, with the distinguished honorary title of Marshal of France. General Nivelle, the hero of Verdun, who had been promoted to command all the armies in France, Dec. 12, and General Sarrail, who commanded the army at Saloniki, were brought directly under the Ministry of War. Briand's innovations were approved by a majority (314) of the Chamber of Deputies, but 165 voted in opposition.

GERMANY

In its conduct of the war in 1916, the German Government presided over by Imperial Chancellor von Bethmann-Hollweg began to encounter significant opposition, from the more radical Socialists on the one hand, and from the more extreme nationalists on the other. After the historic debate of December, 1915, in which the non-Socialist parties had approved the Chancellor's deliberately ambiguous declaration that after the war Belgium and Poland must not be permitted to serve as avenues for attacks upon Germany, Dr. Karl Liebknecht, the most outspoken pacifist in the Social Democratic group, and Herr Haase, one of the Socialist leaders, not only demanded peace without conquest but voted, together with 18 other Socialists, against the fifth war credit, Dec. 21, 1915. The majority of the Social Democratic group, however, was more strongly nationalist in spirit, and indignantly expelled Liebknecht, Jan. 12, and Haase, March 24, with the result that 18 pacifists bolted the party and established an insurgent "Social Democratic Labor" group under the leadership of Haase and Ledebour. Two extremists, Liebknecht and Rühle, held aloof from either faction. Liebknecht was arrested for haranguing a May-Day peace meeting in Berlin, and was sentenced to 49 months' penal servitude. (See also XV, *Socialism.*)

While the extreme Left, the pacifist-Socialists, were growing bolder in their pleas for peace, in their demands for the freedom of the press, democratic reform, and cheaper food, Conservative jingoes of the Right, on the other hand, censured the Chancellor for his moderation. As patriots the Conservatives frankly favored conquests, as reactionaries they feared that Bethmann-Hollweg might yield to democratic demands, as landlords they were prone to ascribe the distressingly high cost of food to England's blockade rather than to inadequate governmental regulation of prices. The Conservatives therefore clamored for more vigorous prosecution of the war and for ruthless utilization of every weapon against England. The resignation of Grand Admiral von Tirpitz on March 16 and his replacement as Secretary for the Navy by Vice-Adm. Eduard von Capelle called forth a storm of adverse comment, because von Tirpitz was regarded as the sponsor of submarine warfare. The National Liberals, ever zealous for German maritime and mercantile interests, joined the Conservatives in an attempt to make the influence of the Reichstag effective

against the Ministry's decision and in favor of ruthless submarine activity. The Chancellor, however, stood his ground and the submarine campaign was moderated in May (see III, *International Relations*).

Conservative Prussian landlords were still further discomfited by the announcement in May of the Government's decision to establish more drastic regulation of food supplies and prices. Vice-Chancellor Clemens Delbrück, who as Imperial Secretary for the Interior had failed to solve the food problem, was superseded by the brilliant economist, Dr. Karl Helfferich; the Ministry of Finance, vacated by Dr. Helfferich, was assigned to Count von Roedern, a former governor of Alsace-Lorraine; and on May 23 a Food Regulation Board was established under the chairmanship of Herr Adolph Tortilovitz von Batocki with dictatorial powers. Soup kitchens were established in the larger cities. Meat cards were introduced locally during the summer. The "food dictator's" decrees, however, were neither so drastic nor so effective in curbing prices as the poorer classes had anticipated. Not until September was there any substantial reduction of the cost of bread. The potato crop was less bountiful than in 1915. The meat problem remained so serious that at the opening of October meat cards were made compulsory for the entire Empire, and 250 grams of meat per week was established as the maximum ration. It was not surprising, therefore, that popular complaint became general and reports of food riots frequent.

Interest in the discussion of possible peace terms kept pace with anxiety regarding the food problem. Endeavoring to steer a middle course between Conservative annexationists and Socialist pacifists, Dr. von Bethmann-Hollweg in his Reichstag speech of April 5 intimated that Poland, Lithuania, and Livonia must be emancipated from Russia; at the same time, he advocated "a peaceful arrangement of European questions" after the war. Two months later he reproached the Entente Allies for prolonging the war. On June 20 the Social Democrat Scheidemann declared that the Chancellor had orally repudiated all pan-German schemes for the annexation of Belgium and northern France. In August a semi-official "National Committee for Obtaining an Honorable Peace" opened a campaign to educate public opinion in favor of moderate terms, while a chauvinist "Independent Committee" agitated for wholesale annexations, and Socialists clamored for liberty to promote their anti-annexationist propaganda. When the Reichstag reassembled late in September, von Bethmann-Hollweg endeavored to conciliate the Socialists by reiterating that Germany sought "nothing but the defense of our rights, our existence, and our freedom"; but in the same speech he attempted to satisfy the jingoes by inveighing against England and by promising to use all possible weapons against Germany's arch enemy. The Conservative and National Liberal champions of unrestricted submarine warfare were nevertheless so belligerent that the Reichstag was adjourned for a fortnight while the military, financial and diplomatic situation was secretly discussed in committee. The party leaders, however, were still unable to agree, and when the Reichstag resumed its public sittings, Oct. 11, the debate was renewed with greater intensity than ever. Consequently, as soon as the necessary war credits of 12 billion marks had been approved, and a bill put through to postpone elections until 1918, the Reichstag was adjourned and the discussion of war policies was again thrown into the secrecy of committee rooms. It was thus to the main committee of the Reichstag that Dr. von Bethmann-Hollweg on Nov. 9 addressed his interesting statement that the German Government would favor a peace league after the war on certain conditions. The resignation of Gottlieb von Jagow as secretary of foreign affairs, Nov. 21, seemed to have been occasioned by ill health rather than by a diplomatic crisis; his successor, Zimmerman, however, had given utterance to more emphatic convictions on the submarine question than von Jagow had evinced.

The sixth war credit (12,000,000,000 marks), voted in June, and the seventh (12,000,000,000 marks), voted on Oct. 28, brought the total of

appropriations since the outbreak of the war up to the figure of 64,000,000,000 marks. The loans issued to cover this war expenditure were regarded by Finance Minister Count von Roedern as convincing testimonials of Germany's financial strength; payments on the third loan, completed in January, amounted to 12,160,000,000 marks; more than 10,700,000,000 marks were subscribed to the fourth; and the fifth loan, by the end of October, had brought in over 10,650,000,000 marks, while the rate of interest still remained at the comparatively low level of five per cent. Moreover, during the first eight months of 1916 savings banks showed increases of 1,710,000,000 marks in deposits, exclusive of the amounts subscribed to the war loans. The success of the war loans, however, was specious, if credit be placed in the complaint of the Socialist, Dr. Eduard Bernstein, that subscriptions had been obtained only by the exercise of pressure and at the risk of ruining several big financial institutions.

On Aug. 29 General von Falkenhayn was superseded by Field Marshal von Hindenburg as chief of the General Staff; at the same time General von Ludendorf was appointed quartermaster-general. Two months later the creation of a munitions department was announced, and Lieutenant-General von Stein, fresh from active service on the western front, succeeded Wild von Hohenborn as War Minister. A "man-power" bill was adopted by the Reichstag, by a vote of 235 to 19, on Dec. 2, rendering all able-bodied males between the ages of 18 and 60 liable to either industrial or military service.

In the Prussian Landtag, on Jan. 13, Dr. von Bethmann-Hollweg promised reform of the Prussian electoral system after the war. In October occurred the death of Otto, former king of Bavaria, who was deposed on Nov. 5, 1913, because of incurable insanity.

GREECE

The determination of the Entente Allies to interpret the "benevolent neutrality" of Greece in a broad manner was so stubbornly opposed throughout the spring by Premier Stephanos Skouloudis, that in exasperation the Governments of France, Russia, and Great Britain at length dispatched a collective note to Greece, June 21, demanding (1) demobilization of the army, (2) dismissal of the Skouloudis Ministry, (3) dissolution of the Chamber, and (4) "the removal, in accord with the Powers, of certain [pro-German] police officials." Premier Skouloudis resigned rather than ask the King to accede to these terms, but Constantine decided to bow to the Entente's will and complied with all four demands (see also III, *International Relations*). Ex-Premier Alexander Zaimis, who had been forced out of office in November, 1915, was reinstated as Premier and Foreign Minister, June 22. The Entente Allies thereupon terminated the commercial blockade by means of which they had brought Greece to terms. But in August and September the development of an Allied offensive in northern Greece and the invasion of Greek territory by the Bulgars (see *The European War, infra*) brought on a new crisis. The continuance of Greek neutrality was menaced on every side—by the enthusiastic volunteers who rose in arms against the Bulgar invaders, by ex-Premier Venizelos, who publicly threatened revolution, and by the Entente Ministers, who during the first week in September forced Zaimis to surrender Greek telegraphs and posts to Anglo-French authorities (see III, *International Relations*). Greek neutrality was fast becoming a farce, yet King Constantine obstinately refused to abandon it in favor of active participation in the war. Premier Zaimis tendered his resignation on Sept. 11. The situation of King Constantine was rendered still more embarrassing, just at this juncture, by the Bulgarian occupation of the Greek seaport of Kavala, Sept. 12, and the transportation of the Greek garrison to Germany as "guests." In vain the King besought M. Demitracopoulos, then M. Zaimis again, to assume the heavy responsibilities of presiding over the new Cabinet; finally, Nikolas Kalogeropoulos, a Theotokist, was induced to form a Cabinet, Sept. 16, with Alexander Carapanos as Foreign Minister, and Loucos Roufas as Min-

ister of the Interior—"a collection of puppets and intriguers," according to the London *Times*. Kalogeropoulos, however, speedily discovered his inability to reach an amicable agreement with the Allies, who rebuffed his qualified proposal, Sept. 18, to bring Greece into the war; nor could he maintain order in Greece. Rebellions arose in Macedonia and in Crete. On the night of Sept. 25-26 Eleutherios Venizelos and Admiral Condouriotis sailed to Crete, where they set up an insurrectionary government. Kalogeropoulos gave place, Oct. 4, to Spyridon Lambros, Oct. 10. During October and November the new Premier helplessly witnessed the progress of the Venizelos revolution in Crete and in Macedonia, while the French admiral Du Fournet compelled him to surrender the Greek navy, Oct. 11 (three of the Greek warships were not taken until Oct. 16), took charge of Greek railways, seized the port of Piraeus, landed marines to prevent anti-Entente demonstrations in Athens, and subjected the Athenian newspapers to French censorship. At the Allies' bidding, Lambros expelled the diplomatic representatives of the Central Powers. Du Fournet's further demand, however, that Greece hand over to the Allies all the munitions, artillery, and equipment of the Greek army, excepting some 50,000 rifles, was more than Constantine could bring himself to accept, until Allied marines had clashed with Greek troops at Athens, Dec. 1, and a compromise been arranged by neutral diplomats, whereby Greece retained four of the ten batteries of mountain guns demanded. Later in December the Allies blockaded the Greek coast and demanded, among other things, the removal of the Greek army to the Peloponnesus. (See also III, *International Relations.*)

ITALY

Socialist opposition to the Salandra Ministry and patriotic disappointment at the slow progress of military operations against Austria-Hungary gave rise to bitter criticism of the Italian Government, increasing in intensity during the spring. Again and again Opposition leaders urged the formation of a truly representative coalition Ministry. Nevertheless, a majority of 394 against 61 upheld the Ministry's economic policy in a vote of confidence. Criticism of the military administration was forestalled by the resignation of General Zupelli, April 5, as Minister of War, and the appointment of Gen. Paolo Morrone, an experienced commander; the foreign policy, ably defended by Baron Sonnino, was approved by 352 to 36 on April 16. But the Trentino reverses in May (see *The European War, infra*) brought on a real crisis. On a vote of confidence, June 10, Salandra was able to muster only 158 votes against a hostile majority of 197 Giolitti adherents, Radicals, Nationalists, and Socialists. The Salandra Cabinet resigned on the following day. A week later the Nestor of Italian politics, Signor Boselli, formed the following coalition Ministry: Premier, Paolo Boselli (Liberal Conservative); interior, Vittorio Orlando (Liberal Democrat); foreign affairs, Baron Sidney Sonnino (L. Cons.); treasury, Paolo Carcano (L. D.); education, Francesco Ruffini (L. C.); war, Gen. Paolo Morrone; Marine, Adm. Camillo Corsi; railways and merchant marine, Enrico Arlotta (L. C.); justice, Ettore Sacchi (Rad.); finance, Filippo Meda ("Catholic"); public works, Ivanoe Bonomi (reformist); post office, Luigi Fera (Rad.); colonies, Gaspare Colosimo (L. D.); agriculture, Giovanni Raineri (L. D.); industry and commerce, Giuseppe De Nava (L. C.); without portfolio, Leónida Bissolati Bergamaschi (Reformist); Leonardo Bianchi (Constitutional Democrat); Ubaldo Comandini (Republican); Vittorio Sciajola (Liberal of the Right). In the ministerial declaration of policy, Premier Boselli reaffirmed Italy's unswerving loyalty to the Entente, and promised to introduce measures for the regulation of the food supply and the restriction of luxury. An overwhelming majority of the Chamber of Deputies upheld the new Ministry, although 44 intransigeant Socialists constituted an uncompromising opposition. In partial fulfilment of its promises, the Government formally declared war against Germany, Aug.

28; adopted a ship-subsidy scheme; elaborated decrees for the conservation of the food supply, and decreed that all cultivable land must be used either for tillage or for pasture, regardless of the will of the owner. One of the most interesting economic measures was the subsidy of £50,000 granted to a British Italian Corporation, Ltd., to promote the joint economic interests of Italy and Great Britain. On Dec. 6 a Socialist resolution calling for immediate peace negotiations was negatived by 293 votes to 47.

RUSSIA

The frequency of Cabinet crises in Russia during the year betokened a lack of popular confidence in the statesmanship of the ministers and the efficiency of the administration. Although the Ministry was not politically responsible to the Duma, the pressure of public opinion was sufficiently powerful to cause the dismissal of unpopular Ministers by the Tsar. The mere list of important resignations is impressive: Premier Goremykin, Feb. 1; Minister of the Interior Khvostoff, March 18; War Minister Polivanoff, March 29; Foreign Minister Sazanoff, July 23; Minister of the Interior Khvostoff, a second time, Oct. 2; and, finally, Premier Stürmer, Nov. 24. In season and out of season Duma members upbraided the Ministers for failing to display the energy, the constructive policy, the determination, necessary for the achievement of victory. A former War Minister, General Soukhomlinov, was arrested and arraigned on the charge of treasonable negligence, for having failed to provide ample munitions and adequate strategic railways before the war. The Russian nation, it appeared, was beginning to evince a determination to hold its Government to account.

The aged president of the Council of Ministers, M. Goremykin, who had withstood incessant criticism for almost two years, at length tendered his resignation, Feb. 1, pleading that his ill health rendered continuance of his arduous official duties impossible. Goremykin's successor, Boris Stürmer, was at least an administrator of energy and ability, although his conservatism could hardly have pleased the Duma; he had been known to the public as the associate of von Plehve and as the principal spokesman of the Right in the financial debates of the Council of the Empire.

On Feb. 22, while the nation was still jubilant over the capture of the great Turkish stronghold of Erzerum, the Duma was most auspiciously opened by the Tsar in person. During the ensuing four months the Duma labored in the interest of railway extension, the promotion of cooperative enterprises, the enforcement of food economy by the establishment of four "meatless days" a week and by the prohibition of vodka. A bill was passed for the permanent prohibition of the sale of distilled liquors; only wines containing less than 12 per cent. alcohol were to be permitted. With unflinching patriotism the Duma voted the huge budget, carrying appropriations of 3,377,000,000 rubles in addition to a war expenditure estimated at 11,000,000,000 rubles, as compared with 8,000,000,000 in 1915. An income tax and a considerable augmentation of the educational appropriation were interesting features of the budget as finally approved by the Duma and Council of Empire and sanctioned by the Tsar April 24. Nor was the Duma unmindful of the need for democratic reform. On July 2 a most important bill was passed conferring upon peasants the same rights as other classes possessed. The peasants since 1890, it will be remembered, had not been entitled to elect deputies to the zemstvos (provincial councils) but merely to nominate a list of candidates from which the provincial governor made an arbitrary selection.

Notwithstanding the fact that much was accomplished, the Duma's deliberations were marked by occasional outbursts of discontent. Patriots complained of military inactivity. Liberals complained of the non-realization of their aspirations toward political liberty, racial equality, and generous treatment of Finns and Poles. In the Duma sitting of March 24 a debate on alleged persecution of the Jews led to a scene of tumult, in the midst of which the Conservative

party angrily marched out of the hall. Under fire of adverse criticism, Minister of the Interior Alexei Khvostoff handed in his resignation. War Minister Polivanoff also resigned in March, being replaced by General Shuvayeff. The Russian victories in June (see *The European War, infra*) perceptibly improved the situation of the Government. In July, however, dissensions arose within the Council of Ministers, possibly on the question of negotiating an immediate separate peace with Austria-Hungary or, more probably, on the question of pledging real self-government for Poland. Foreign Minister Sazanoff advocated autonomy for Poland and loyalty to the Entente; Premier Stürmer was recognized as an enemy of Polish self-government and was suspected of a desire to make separate terms with the Central Powers. With regard to Poland, at least, the Premier's views prevailed, and on July 23 Sergius Sazanoff resigned the portfolio of foreign affairs into the hands of Premier Stürmer, who took pains to inform the Press that Russia would continue loyal to the Entente. At the same time Alexei Khvostoff was reinstated as Minister of the Interior and the department of Justice was given to A. A. Makaroff, reputed to favor constitutional reform in Russia and a separate peace with the Teutonic Powers. Khvostoff, however, was no more successful during his second than in his first term of office, and ten weeks later, Oct. 2, he was superseded by Dmitryevitch Protopopoff, the vice-president of the Duma, a man popular with the Liberals because of his belief in constitutional government and equal rights for the Jews, esteemed by the aristocracy because of his noble estate of 20,000 acres, and trusted by the business community because of his ownership of a large cloth factory and his successful ventures in finance. One of Protopopoff's first achievements was the formulation of a scheme for a joint zemstvo or provincial assembly for Courland, Esthonia, and Livonia.

With the resumption of the Duma's sittings in November, criticism of the Government was again publicly voiced. M. Shidlovisky, spokesman of the *bloc* comprising Progressive Nationalists, Center, Zemstvo Octobrists, Octobrists, and Cadets, frankly declared that the press was gagged and public opinion antagonized, while the food supply was being mismanaged and the Polish problem bungled. Forty Progressives, even more outspoken, withdrew from the *bloc* in order to insist more emphatically upon ministerial responsibility. On Nov. 21 the Constitutional Democratic leader, Prof. Paul Milyukoff, announced his opinion that, thanks to the conciliatory attitude of the War and Marine Ministers, the crisis would pass. Then rather unexpectedly on Nov. 24 Premier Stürmer was dismissed and Alexander Trepoff, Minister of Railways, appointed to preside over the Council of Ministers. Neratoff took the portfolio of foreign affairs, Nov. 25. The fall of Stürmer in the midst of bitter parliamentary criticism did not necessarily imply recognition of the principle of ministerial responsibility in Russia; it was, however, an unmistakable success—though probably not a decisive victory—for the patriotic leaders who had fearlessly exposed the defects of blundering bureaucracy, for the partisans of the Entente, who had accused Stürmer of desiring a separate peace, and for the Liberals, who had denounced the Government's ungenerous reluctance to confer equal rights upon the Jews and self-government upon the Finns and the Poles. Emboldened by success, the Duma denounced the deleterious influence of "dark forces" which obstructed the successful prosecution of the war. As a sign of his approval of the popular demand for a war to a finish, the Tsar appointed a strong Entente supporter, Nicolas Pokrovsky, as Foreign Minister, and on Dec. 25 issued a stirring proclamation to his army, declaring that Galicia and Posen must be united to Russian Poland and Constantinople conquered before Russia could make peace. (See also III, *International Relations.*)

SCANDINAVIAN COUNTRIES

In view of the perplexing problems which arose in connection with the defense of their rights as neutral powers, the three Scandinavian countries

held a joint conference at Copenhagen, March 9; there the Premiers of Denmark, Norway, and Sweden decided upon close coöperation and mutual support in upholding neutral rights and in endeavoring to safeguard maritime commerce against mines. In September representatives of the three countries again met in conference at Christiania and resolved to continue the policy of impartial neutrality and collaboration in the maintenance of neutral rights.

Denmark.—During the spring several minor changes were made in the Danish Cabinet: Brandes gave place to Hage as Finance Minister, March 21; Hage assumed the portfolio of commerce, April 29; and the Ministry of Public Instruction and Ecclesiastical Affairs was divided, Nielsen retaining control of public instruction and Pouslon undertaking to supervise ecclesiastical affairs. On Aug. 4 the Danish minister to the United States signed a treaty for the sale of the Danish West Indies to the United States for the sum of $25,000,000 (see III, *International Relations*). The Danish Rigsdag, however, was extremely reluctant to ratify the treaty, and the Opposition leaders by demanding an election on the issue attempted to make political capital out of patriotic sentiment. Rather than risk the result of an election, Premier Zahle strove to conciliate his antagonists and offered to form a coalition Cabinet, but his negotiations to this end proved unsuccessful, Aug. 24. After protracted disputes, both houses of the Rigsdag accepted a proposal, Sept. 30, to institute a plebiscite on the question of ratifying the sale treaty. At the same time, a Socialist (T. H. Stauning), a member of the Left (Ex-Premier J. Christensen), and a conservative (M. Rottboell) were brought into the Cabinet without portfolio. In the plebiscite, held on Dec. 14, some 283,000 votes were cast in favor of the sale, and 157,000 against it. A week later the Folksthing and the Landsthing ratified the treaty.

Norway.—The newly elected Norwegian Storthing, which convened in January, adopted a constitutional amendment (by 91 to 14 votes) rendering women eligible to the Council of State. The Storthing also had to deal with serious labor disputes. A strike of iron-miners in January, followed by lockouts and a general strike involving 200,000 workers, threatened to paralyze the industrial life of the nation. In the face of this crisis the Storthing adopted a law for compulsory arbitration. Labor organizations were at first hostile to the experiment, but as the arbitration tribunal in its first awards generally upheld demands for higher wages, the opposition of the workingmen was disarmed. According to the London *Daily Chronicle*, Norway's entire catch of fish was purchased by Great Britain.

Sweden.—The strained relations existing between Sweden and the Entente Allies (see III, *International Relations*) lent added weight to the arguments of the "activists," who urged thorough military preparation for active defense of Sweden's national interests. The strengthening of Sweden's military forces was emphatically advocated in the speech from the throne at the opening of the Riksdag, Jan. 17. Consequently, on March 29, the Riksdag consented to an army appropriation of 104,000,000 kronor ($27,870,000). Three Socialists who stood out against the militarist campaign and urged the workingmen to declare a general strike in case of war were convicted of incitement to treason and sentenced to from one to three years' imprisonment at hard labor.

OTHER EUROPEAN COUNTRIES

Belgium.—Although much was done by the German military administration to promote the economic reconstruction of Belgium, very bitter protests were evoked by Governor-General von Bissing's decrees of May 15 and October 3, which compelled unemployed Belgians to accept work even when that work might be to the advantage of Germany. A climax was reached in November, when thousands of Belgian civilians, of military age, were forcibly taken from their homes and sent to Germany, where they were to be given employment. The Belgian Foreign Minister, Baron

Beyens (who had replaced M. Davignon in January), immediately remonstrated, on the ground that this form of industrial conscription was a gross violation of international law and was designed simply to release German workers for military service (see also III, *International Relations*). Another cause of popular indignation was the exaction of financial contributions; the general war contribution, levied in lieu of taxes for the support of the Government, was increased from 480,000,000 francs to 600,000,000 francs; in addition a fine of 5,000,000 francs was imposed upon the city of Brussels for permitting the celebration of the Belgian national holiday.

The Netherlands.—The maintenance of special border patrols and the execution of other war-time duties so severely taxed the resources of the Dutch treasury that a "war loan" was necessary. Nevertheless, the Dutch Government endeavored to finance an old-age pensions scheme. A ministerial crisis developed in January and resulted in the replacement of Finance Minister Treub, who resigned on Feb. 3, by Van Gijn, Feb. 11. In June Socialist complaints were heard in the Chamber of Deputies on the score of the high cost of living; to relieve the situation, the Government introduced a bill appropriating 20,000,000 florins to be expended by the communes in the provision of cheap foodstuffs. Although a manifesto in behalf of Belgium's independence, signed by 150 prominent citizens, seemed to indicate a strong anti-German agitation, Queen Wilhelmina's speech from the throne at the opening of the States-General in September expressed an unshaken resolve to maintain Dutch neutrality. The programme of legislation outlined by the speech from the throne included an augmentation of the army and navy, provision of cheaper food, and amelioration of conditions in the Dutch East Indies.

Portugal.—The entry of Portugal into the war (see III, *International Relations*) was speedily followed by the resignation of Dr. Costa's Democratic Cabinet and the formation of a "war ministry," with Dr. Antonio de Almeida as Premier and Minister of Colonies; Azevedo Coutinho, marine; Dr. Affonso Costa, finance; Norton Mattos, war; Dr. Augusto Soares, foreign affairs; Dr. Mesquita Carvalho, justice; Antonio Maria da Silva, public works; Dr. Pedro Martins, public instruction; Pereira Reis, interior. Recurrent local insurrections and mutinies in Lisbon during April and May gave evidence that neither the nation's formal participation in the war nor the reconstruction of the Cabinet had sufficed to conciliate the enemies of the republic.

Rumania.—The passionate exhortations of Take Jonescu and other pro-Entente statesmen were finally heeded by Premier Bratiano and after two years of uncertain neutrality, Rumania entered the war on Aug. 27 (see also *The European War, infra*, and III, *International Relations*). An extraordinary military credit of $125,000,000 was voted; General Paraskivesco was appointed director of munitions; and Vintilla Bratiano, a brother of the Premier, was made Minister of War. After the military *débâcle* in December, the Cabinet was reconstructed, but the Bratiano brothers remained at the helm, Jon as Premier and Vintilla as War Minister. Not without political interest was the death of the dowager queen, Elizabeth ("Carmen Sylva"), March 2.

Serbia.—After the conquest of Serbia in 1915, King Peter, escaping by way of Scutari, established his residence in Greece, while the Serbian Skupshtina reassembled on the Greek island of Corfu. The hope expressed at the September session of the Skupshtina, that the Serbian Government might soon be able to return to Serbian soil, was realized in November, when Monastir was wrested from the Bulgars (see *The European War, infra*).

Spain.—Notwithstanding its failure to solve the grave problem of the high price of food, Count Romanones's Liberal Ministry, formed in December, 1915, was returned to power by the elections of April 9 with a comfortable majority of 235 in a house of 431 members, while the Conservative group shrank to 86 (not including 16 "Maurists") and the Republicans gained only one seat in addition to

the 18 previously held. Even more satisfactory to Count Romanones were the elections to the upper Chamber of the Cortes, April 23, in which the Liberals obtained 112 seats, the Conservatives 34, the Regionalists seven, the Maurists five, and others 22. The attention of the Liberal Government was chiefly devoted to the promotion of business interests. Comparatively little was done to lower the cost of living; but when the business of the country was imperilled by a general strike in July, the Government promptly proclaimed martial law and compelled the strikers to accept arbitration. Moreover, in November, Finance Minister Don Santiago Alba unfolded to the Cortes a remarkable scheme which the Cabinet had conceived for the stimulation of Spanish industry; in the "extraordinary budget" special expenditures of 2,133,606,494 pesetas were provided for, nearly half of the sum falling to the Ministry of Fomento for the construction of railways and other public works, while 680,000,000 pesetas were allotted to national defense. Furthermore, Senor Alba proposed that the Government advance 50 per cent. of the capital for the creation of new industries, at five per cent. interest, the necessary funds being raised by issues of Treasury bonds up to a maximum total of 100,000,000 pesetas; and in addition, the Government would guarantee a return of five per cent. on all capital invested in certain industries.

Switzerland.—Vice-President Camille de Coppet was regularly elected president of the Swiss Confederation on Dec. 15, 1915, and Edmund Schulthess vice-president. Partially to defray the extraordinary cost of national defense during the war, the Federal Council in September levied a tax of 25 per cent. upon all war profits since Jan. 1, 1915.

Turkey.—Reports of the suicide (Feb. 1) or murder of Prince Yussuf Izzedin Effendi, heir apparent to the Turkish throne (succeeded as crown prince by Wahid-eddin Effendi), and mendacious rumors of the assassination of War Minister Enver Pasha were cited by uncritical observers as portents of popular revolt. No such revolt occurred, however, in Turkey proper, although in Arabia an insurrection was instigated in June by the Grand Shereef of Mecca, and after Mecca, Jedda, Kinfunda, and Taif had fallen into his hands, the insurgent Grand Shereef, Hussein Ben Ali, established himself as sovereign of an independent kingdom of Arabia, with his capital at Mecca. (See also III, *International Relations.*)

Circumstantial details regarding the Armenian atrocities were published in a lengthy report prepared by Lord Bryce; at least 800,000 (possibly as many as 1,200,000) Armenians had been deported from their homes, and 300,000 or more had either been massacred or succumbed to starvation and exposure. The Turkish Government, on the other hand, published in February an official defense of its conduct.

ASIA

China.—Following Yuan Shih-kai's public acquiescence in the reactionary project of imperial restoration, in December, 1915, a formidable Republican revolution broke out in Yunnan, under the leadership of Tsai Ao, and rapidly spread to neighboring provinces in southern and central China—Kweichau, Kiangsi, Hupeh, Szechuan, Fukien, and Hunan; mutinous outbreaks occurred in the important city of Nanking. By the end of May the rebellion embraced all the southern provinces, as well as Shensi, Shansi, and Shantung. As the revolution made headway, Yuan Shih-kai faltered in his determination to assume the imperial crown. At first, on Jan. 21, the formal coronation was postponed *sine die;* later, on March 22, Yuan announced his decision to abandon the scheme altogether and to revert to the republican constitution. A special session of the Council of State, March 27, solemnly repealed all monarchical legislation and restored the republic, and finally, in a desperate endeavor to retrieve his blunder, Yuan surrendered all civil authority to a responsible Republican Cabinet, April 22, with Tuan Chi-jui, a conspicuous Republican leader, as Premier and War Minister. The Republican revolutionaries, however, scorned all concessions, and 216 members of the National Assembly de-

clared that nothing short of Yuan's resignation or overthrow could avert disaster. Such was the *impasse* to which the Government of China had been reduced when on June 6 Yuan Shih-kai died of uræmia. Yuan's death automatically brought into power Vice-President Li Yuan-hung, the Republican general who had commanded the revolutionary forces in 1911. The new President at once came to terms with the insurgents, declared a general amnesty, convoked the Republican National Assembly which had been summarily dismissed by Yuan Shih-kai in October, 1913, and appointed a "compromise Cabinet," June 30, with Tuan Chi-jui as Premier and War Minister and Tang Shao-yi as Minister of Foreign Affairs. The inauguration of the new *régime* was most unfortunate. Within two months the new Minister of Justice, Chang Yao-tseng, fell under suspicion of complicity in a gigantic opium-smuggling plot; a little later Foreign Minister Tang Shao-yi incurred the displeasure of the military party and was replaced by Wu Ting-fang, a pronounced liberal, and a former Minister to the United States; in November the Minister of Marine was dismissed and his portfolio given to P. K. Ching; and Minister of the Interior Sung Hung-Yi tendered his resignation after a quarrel with the Premier. Gen. Feng Kuo Chang, military governor of Nanking, was elected Vice-President of the republic by the National Assembly late in October. (See also III, *International Relations*).

Japan.—Opposition to Count Okuma's Ministry in Japan appeared to be declining in strength during the spring and summer, although critics of the Government inveighed against his Chinese policy and continued to reproach him in the matter of the Oura bribery case of 1915. An unsuccessful attempt in January to assassinate the Premier strengthened rather than hurt the Ministry. The resignation of Gen. Ichinosuke Oka as Minister of War, March 30, was caused not by dissension within the Cabinet, but by ill-health. General Oka was succeeded by his former assistant, Ken-Ichi Oshima. In June the leaders of three important factions in the lower house, Viscount Kato, Mr. Hara, and Mr. Inukai, formed a majority *bloc*, the Kenseikai, which was prepared to support Count Okuma on many issues. The opposition of the upper house of Parliament, rather than that of the lower house, was responsible for Count Okuma's resignation, the first week in November, and the appointment of a non-partisan bureaucrat, Gen. Count Terauchi, to succeed Okuma was a distinct rebuke to the advocates of ministerial responsibility. The fact that Count Terauchi had been remarkably energetic as Minister of War and subsequently as governor of Korea, led many apprehensive observers to conclude that the cabinet crisis was to be interpreted as a victory for militarist and imperialist policies. Count Terauchi, however, emphatically disclaimed any tendency to wave the sword"; he assured the Associated Press of his amicable intentions respecting the United States; and he promised unswerving loyalty to the Entente. (See also III, *International Relations.*)

On Nov. 3 Prince Hirohito, eldest son of Yoshihito, was ceremonially installed as Crown Prince and heir to the throne.

A law against child labor prohibited the industrial employment of children under 12 years; young persons between the ages of 12 and 15 and women of mature age were permitted to work no more than 12 hours a day, with two holidays a month; accident compensation also was provided.

Persia.—During the first six months of 1916 the occupation of northwestern Persia by Russian forces compelled the young Shah, who was completely at the mercy of the invader, to maintain an attitude of very benevolent neutrality toward the Entente Allies. In March Sipah Salar Azam was appointed Premier; German propaganda was suppressed and German agents arrested. In May Persia's finances were placed in the hands of an Anglo-Russian commission. A new Cabinet was formed late in August under the presidency of Vossough ed Dowleh, the subordinate posts being filled by men of moderate views and pro-Entente sympathies.

THE EUROPEAN WAR[1]

ALEXANDER MARTIN

The Opposing Forces.—At the beginning of the year Serbia, Russia, Belgium, France, Great Britain, Montenegro, Japan, and Italy, which are known as the Entente Allies, were at war with Austria-Hungary, Germany, Turkey, and Bulgaria, known as the Central Powers. Albania joined the Allies in January, Portugal joined them in March, and Rumania on Aug. 27. Italy, which had not been formally at war with Germany, declared war against her on Aug. 27. The Allies, as the result of a conferencec held in Paris, agreed upon a plan for unity of action against the Central Powers in 1916. They planned to await the favorable season for operations when they should be well supplied and equipped for a great offensive. The Germans attacked Verdun in February and the Austrians opened an offensive against Italy in May, but these things were not allowed to interrupt the programme. The British took over in the spring the front held by the Tenth French Army, and France was not only able to meet the attack on Verdun but she also prepared for a joint offensive with the British on the Somme.

The War on the Sea.—The Allied command of the sea throughout the year was complete to a degree never contemplated by students of naval warfare prior to the outbreak of the present war. No German merchant ship appeared upon the ocean, with the exception of two cargo submarines; no German fleet has remained at sea for more than 48 hours; and German efforts at commerce destroying have been limited to the cruise of a single ship and the submarine warfare which has been effectually held in check by the anti-submarine craft of the Allies. The Allies have enforced a blockade of the Central Powers with an ever-increasing stringency. The main British fleet, based upon the Orkney Islands, has held possession of the North Sea, and, under its protection, the transfer of Allied troops by sea has been practically unmolested. Mr. Balfour stated on March 7 that the British navy had been increased by a million tons since the war began.

Grand Admiral von Tirpitz, the founder of the German Navy, resigned as Minister of Marine on March 16 and was succeeded by Admiral von Capelle. On Nov. 29 Adm. Sir John Jellicoe became First Sea Lord of the British Admiralty and was replaced by Vice-Adm. Sir David Beatty in command of the Grand Fleet.

On March 4 the German Naval General Staff announced that the auxiliary cruiser *Moewe*, after a successful cruise lasting several months, had arrived at a home port with 199 prisoners and 1,000,000 marks ($250,000) in gold bars. She had sunk or sent to neutral ports as prizes 12 British steamers varying in tonnage from 3,146 to 7,781 tons, one small British sailing vessel, and one French and one Belgian steamer. At several points on the enemy coast she had laid mines, one of which was credited with sinking the British battleship *King Edward VII.* She had made her captures off the Portuguese, Spanish and Moroccan coasts. On March 7 Mr. Balfour stated that the *Moewe* had returned to Germany by going around Iceland. Her largest and most notable prize, the British steamer *Appam*, arrived in Hampton Roads, Va., on Feb. 1, under a German prize crew of 22 members commanded by Lieutenant Berg, carrying 20 released German prisoners and 409 other persons taken from captured ships (see also III, *International Relations*).

In an engagement in the North Sea on Feb. 29 between the armed German raider *Grief*, which was attempting to reach the Atlantic disguised as a Norwegian merchant vessel, and the British armed merchant cruiser *Alcantara*, both vessels were sunk, the *Grief* as the result of gunfire and the *Alcantara* by a torpedo.

Naval Battle off Jutland.—On the afternoon of May 31 the British Grand Fleet under the command of Adm. Sir John Jellicoe, while upon

[1] The international aspects of the European War are discussed in Department III, *International Relations*. A complete chronology of the war is given in Department XXXII.

one of its periodical "sweeps" through the North Sea, encountered the German High Seas Fleet under Adm. Reinhold von Scheer off the coast of Jutland. The center of the battle area may be placed roughly at 200 miles from the German naval base at Wilhelmshaven and 400 miles from the British base in the Orkney Islands. According to the account of Vice-Adm. Sir David Beatty, who commanded the battle-cruiser division of the British fleet, the afternoon was fine, with a light wind from the southeast, the sea calm, and the visibility fairly good. At about 2:30 p. m. the advance units of the two fleets sighted each other and shortly thereafter the commanders of the battle-cruiser squadrons became aware of each other's strength. Vice-Admiral Hippar in command of five German battle-cruisers retired southeastward toward the main body of the German fleet, pursued, on a parallel course to the westward, by Beatty, with six heavier and more powerful British vessels, supported, at a distance of five or six miles to the northwestward, by four ships of the Fifth Battle Squadron under Rear-Admiral Evans-Thomas. The action between the battle-cruisers began at 3:48 p. m., at a range of 18,500 yds. Early in the action a column of black smoke 400 ft. high shot upward from the *Indefatigable*, the last ship in the British battle-cruiser line, and when it cleared away the cruiser had disappeared. Two survived out of a crew of 900 officers and men. The Fifth Battle Squadron soon opened on the rear German ships, at a range of 20,000 yds. and at 4:18 the third ship in the German line was seen to be on fire. Shortly thereafter the British battle-cruiser *Queen Mary* disappeared as the result of a tremendous explosion and only about 20 were saved out of a crew of 1,000. The action continued on parallel courses for 54 minutes, when three divisions of the German battle fleet hove in sight and both battle-cruiser squadrons turned and ran northwest. The British ships turned in succession and the Fifth Battle Squadron of four ships of the *Queen Elizabeth* type followed in the wake of the British battle-cruiser squadron. This course brought the contending forces nearer the approaching fleet of Sir John Jellicoe. On the northward run Beatty's four remaining battle-cruisers, by their superior speed, drew ahead and crossed in front of the German fleet in order to clear the way for Jellicoe's battleships and to interpose between the Germans and their naval base. The weight of the action was now sustained by the Fifth Battle Squadron against the four German cruisers closely followed by the German battleships. One of the German cruisers quitted the line and appeared no more in the battle. At 5:56 the flagships of Jellicoe's battle squadrons were sighted by Beatty's cruisers, distant five miles to the north. At 6:20 the Third British Battle-Cruiser Squadron under Rear-Admiral Hood came up and ran to within 8,000 yds. of the German line. The *Invincible*, Hood's flagship, gave battle to a vessel of the *Derfflinger* class and was sunk by a shell; Vice-Admiral Beatty ordered the two remaining ships of the squadron to join his squadron. There were only six survivors from the *Invincible*. As Sir John Jellicoe came upon the scene he formed his three squadrons into line ahead and swept the German fleet off the battle area. Intermittent fighting in the haze and mist, which increased as evening came on, lasted between the battleships for about two hours, and the battle developed into a retreat and a pursuit. During the night the British light cruisers and destroyers attacked the German ships and inflicted heavy losses, but the extent of the losses is a matter of controversy. A few days after the battle the British published their losses to the world; the Germans concealed and denied theirs; and the Battle of the Skagerrack was hailed as a victory for the Germans. But the morning of June 1 found the British fleet patrolling the battle area with no German vessels in sight, and the High Seas Fleet has not since appeared to dispute the control of the North Sea.

The British lost the battle-cruisers *Indefatigable* and *Queen Mary*, which were sunk in action with the German battle-cruisers, and the *Invincible*, which was sunk by a German battleship; the armored cruisers *Defense*,

Black Prince, and *Warrior;* and eight destroyers, the *Ardent, Fortune, Nestor, Nomad, Shark, Sparrowhawk, Tipperary,* and *Turbulent.* They lost no battleships and no light cruisers. The battleship *Marlborough* was torpedoed at 6:54 p. m., but continued to perform her duties as a flagship until 2:30 a. m.; and the *Warspite's* steering gear became deranged and she ran amuck amidst the German fleet and sustained a concentrated fire of six battleships without receiving a vital injury. The three battle-cruisers were sunk supposedly by gunfire, but the circumstances under which they sank indicate that they met their fate by torpedoes or mines. The British official estimate claimed the loss of four German battleships, three of which were seen to sink. It was generally believed that the Germans, knowing the traditional policy of the British navy and relying upon a blindly furious attack by their adversaries, had inflicted a stinging defeat upon the battle-cruiser squadron; but a study of the battle shows that the British leadership was skilful and that the fog and mist alone saved the High Seas Fleet from a decisive action with the more powerful fleet of Sir John Jellicoe. On Saturday, Aug. 19, the German High Seas Fleet appeared in the North Sea, but retired when it found that the British were approaching in considerable strength.

German Submarine Activity.—The British lost nearly 2,000,000 tons of shipping "by enemy action and marine risks" during the first two years of the war. The loss, however, is evenly distributed by insurance and the decrease in the world's shipping enhances the value of that which remains, so that the mercantile marine of Great Britain has never been more prosperous. There has been a decrease in submarine activity, due wholly to the vigilance of the British fleet and its thousands of auxiliaries. The destruction and trapping of German and Austrian submarines has gone on methodically. In June the tally was placed at 81. At the end of February a German proclamation against armed merchant ships went into effect, but the great majority of the ships sunk have been either neutral, or unarmed vessels of belligerents, and in many cases the attacks have been of so flagrant a character that responsibility was disclaimed (see III, *International Relations*). The effect of Germany's submarine war against commerce in 1916 was almost negligible so far as the issue of the war is concerned.

Germany at no time has abandoned legitimate submarine warfare. On Jan. 7 the pre-dreadnought *King Edward VII* (4 12-in. guns) struck a mine or torpedo in a heavy sea; she was abandoned and sank. Two men were injured but there was no loss of life. On Feb. 15 the British light cruiser *Arethusa,* which had taken a prominent part in all the naval actions in the North Sea, struck a mine off the east coast of England and sank, with the loss of 10 lives. On Feb. 26 the French auxiliary cruiser *La Provence,* engaged in transporting troops to Salonica, was sunk by a mine or torpedo in the Mediterranean and upward of 3,130 men were lost out of 4,000 aboard. This was the greatest ocean disaster of modern times. On May 4 the British pre-dreadnought *Russell* struck a mine in the Mediterranean and was lost. Twenty-four officers and 672 men were saved and 124 officers and men were missing. At about 8 p. m., on June 6, the British cruiser *Hampshire,* with Field-Marshal Earl Kitchener and his staff aboard *en route* to Russia on a special mission, was sunk by a mine to the west of the Orkney Islands. A heavy gale was blowing and only one warrant officer and 11 men survived out of 670 persons aboard.

The Western Front.—On Dec. 2, 1915, the anniversary of Austerlitz, General Joffre was placed in command of all of the French armies and General Castelnau was entrusted with the immediate command of the French troops operating in France. On Dec. 15, 1915, Sir Douglas Haig succeeded Sir John French in the command of the British forces in France, and directly afterwards Lieut.-Gen. Sir William Robertson was made Chief of the Imperial General Staff, in place of Lieut.-Gen. Sir Archibald Murray, and made responsible "for issuing the orders of the Government in regard to military op-

erations." Late in December, 1915, the Indian Corps on the western front was sent to Mesopotamia.

According to General Joffre, 122 German divisions were opposed to the western Allies and 50 divisions faced Russia, besides the Austrian armies. On the western front 2,500,000 Germans faced 3,500,000 French, British, and Belgians. The German armies held positions that were better than those of the Allies in point of dominance and facility of observation, due to the fact that they had taken up a defensive position which the Allies were attacking. Everywhere there was a continuous struggle and many sharp local actions in which the losses on both sides were heavy. In February, March, and April the Germans did not attempt any large offensive except at Verdun (see *infra*). During this interval no event of great importance took place on the western front. The line from the sea to the Somme was held principally by the British, but the Belgians held a part of the extreme left, and at places French troops held parts of the line. Between the Somme and the North Sea the Germans massed 3,000 guns and 40 infantry divisions, a force numbering, with auxiliary troops, about 800,000 men.

In the early weeks of the year many signs indicated a great German offensive in the West—the presence of the German Emperor at Mezières, the arrival of the 1916 class of recruits and of 13 new divisions upon the western front, the relief of front-line troops for rest and refitment, reinforcements of heavy artillery from Serbia and of Austrian guns, and feeling attacks all along the line from the Belgian coast to Alsace. From Jan. 10, when they attacked in Champagne, until Feb. 21, the Germans took the offensive at many points on the western front—on the coast, on the Somme, on the Aisne, in Champagne, on the Moselle, and in Alsace—in order to accustom their troops to the resumption of the offensive, to test the Allied strength and dispositions, and to fritter away Allied reserves.

The Battle of Verdun.—On Feb. 21, at 7:15 a. m., the storm broke upon Verdun. The artillery preparation covered a wide front, but the fury of the attack was concentrated upon the section of eight miles from Brabant to Ornes on the east side of the Meuse, where whole districts were filled with German guns. At 5 p. m. the German artillery increased its range, and small detachments of infantry advanced to occupy the French positions. They were met with the French barrage fire and machine gun and rifle fire. At the close of the day the Germans had occupied the first line and a few support trenches, and had taken Haumont Wood and a salient at Beaumont. During the night the French attempted to make a counter attack but the attack failed under the German artillery fire. On the morning of the 22d supplies and reinforcements were cut off by the German barrage. The French evacuated Haumont village, but they recaptured part of the Beaumont salient and they repulsed strong attacks upon Herbebois. By the morning of the 23d the French had been forced almost entirely from their first line in the sector attacked, and had been compelled to evacuate Brabant, Haumont, Bois des Caures, and Herbebois. They had fallen back upon a line Samogneux-Beaumont-Bois des Fosses-Chaumes Wood. On the morning of the 23rd they attempted to take the offensive, but their attack broke down under the German artillery fire. By evening they had lost Samogneux and they determined to withdraw to Talou and Poivre (Pepper) ridges, which the Germans repeatedly assaulted in vain during the following night and the day of the 24th. It was here that the German losses first assumed the proportions which have given the name Verdun a peculiar character of horror and glory in every language. German activity hitherto had been confined to the east bank of the Meuse and the French artillery on the west bank had enfiladed the German assaulting columns. Feb. 24 marks the end of the first phase of the battle. The Germans had captured the entire first line of the French on the right bank of the Meuse, a considerable area, and many thousand prisoners, but they had merely reached the main line of the French defenses.

Hitherto the French General Staff had been in doubt as to whether the attack on Verdun was a feint, but the great sacrifices of the Germans on the 23d and 24th had removed that doubt, and a ceaseless stream of men and material poured into Verdun. Four thousand motor trucks, in addition to the regular motor-truck service of the Verdun armies, and a railway, supplied the French forces. The armies of the German Crown Prince were served by 14 railways. Within a fortnight 200,000 men were carried into the threatened city, and the French built up a line of defense along the Pepper and Douaumont ridges which the most determined efforts of the Germans assailed in vain. On the French left neither side occupied the Talou ridge, which was enclosed on three sides by the Meuse; but each side covered it with artillery fire to prevent the other from occupying it. An army was formed to cover the retreat of the French from Verdun, but the most vigorous measures were undertaken to hold the city. On the 25th General Pétain arrived to take command of the defense. Between Feb. 11 and 16 the Germans brought six infantry divisions and six regiments of heavy artillery to Verdun, and on the 20th they sent in an additional division and they sent two army corps to the immediate vicinity of the city.

On Feb. 25th the Germans renewed the attack; at 2 p. m. they took ridge 344 by storm and by evening they were ready to attack the main French position on Douaumont ridge. Verdun was subjected to a long and merciless bombardment. Wave after wave of German infantry advanced against the French lines only to be destroyed and driven back by the French artillery and machine guns. A small body of the 24th Brandenburgers reached the old dismantled fort of Douaumont; but on the morning of the 26th fresh French troops confronted the Germans and by vigorous counter-attacks they reëstablished the French lines and held them firmly, except the fort of Douaumont, which the Germans recovered later in the day. The fighting continued with unexampled ferocity until the 29th, when there was a pause. The Germans had reached the main French position and had captured and held a small section of it; but they had failed in their object, and they now resorted to operations on the flanks of the main attack. The German shock army, which had been formed and trained for the capture of Verdun, was withdrawn, and the next attacks were undertaken by the ordinary troops of the army of the Crown Prince.

On March 2 the Germans increased the volume of their artillery fire west of the Meuse and maintained it until noon on the 6th, when they launched their first infantry assault on the western bank. They quickly took Forges and Regneville and advanced to the attack of Le Mort Homme (Dead Man Hill), a well fortified and strongly held hill in advance of the French main line. At the same time they renewed their attacks east of the river. From March 8 to March 11 the battle raged from Malancourt, west of the river, to Vaux on the east. Despite tremendous losses in infantry assaults, the Germans made insignificant gains. Between March 14 and 22 they made gigantic efforts to capture the advance lines west of the Meuse. They attacked upon a three-mile front. They threw in fresh divisions and the reorganized troops of the shock army. Their efforts were first directed at Le Mort Homme and then at Hill 304, which lies west of Le Mort Homme. In these attacks the German loss was as great as in their attacks on Douaumont and they did not succeed in reaching the main French line.

There was a lull in the fighting between the 22nd and the 28th of March. On the 28th the Germans renewed their attacks on both banks of the Meuse and continued them with the greatest vigor until April 25. This period was marked by vigorous French counter-attacks. On the 28th, 29th, 30th, and 31st of March, the Germans launched their infantry against Malancourt, on the extreme French left of the battle front. The French evacuated Malancourt on the 31st but they retained the adjacent village of Haucourt. The Germans attacked Le Mort Homme on March 31 and April 1; Avocourt redoubt on April 1; Haucourt on April 3 and

again on the 5th, when they captured the village; Béthincourt on the 5th; the approaches to Haucourt on the 6th, 7th, and 8th; and the entire line from Avocourt on the west to Cumières on the Meuse on the 9th. The only real gain effected was the capture of Béthincourt, which the French evacuated on the night of the 8th. Meanwhile the Germans had renewed their attacks east of the Meuse. After three weeks of inactivity they returned on April 1 to the assault of the fort of Douaumont and the village of Vaux. They made no gains on that day but got a footing in Caillette Wood on the 2d, only to be driven out by a counter-attack on the 3d. On the 4th they attacked Douaumont village and used, for the first time at Verdun, successive thin lines as distinguished from solid masses of infantry in their assaults. On the 5th they made an unsuccessful attempt on Pepper ridge. After two days of bombardment, the Germans assaulted the Douaumont-Vaux line on the 11th, and captured some advance trenches from which they were ejected the following night. On the 17th they delivered a great assault on a front of 1½ miles west of Douaumont and captured a small salient in the French line; and on the 20th they delivered a terrific but useless blow on a two-mile front between Vaux lake and Thiaumont farm. The Germans had continued the struggle west of the Meuse following the 9th of April but they had made no progress. Thus after two months of the most stupendous and terrific fighting in history, along a front of 18 miles, the Germans had reached the main position of the French east of the Meuse and had captured and held a small section at Douaumont; but they had not reached the main defenses west of the Meuse. After the 20th the fighting died away at Verdun. On the 21st and 22nd the Germans made four serious attacks at other places on the western front and a larger number on the 26th and 27th; and the Allies became convinced in the last days of April that the fighting was at an end at Verdun.

Thus far the Germans had gained no permanent footing upon Le Mort Homme and Hill 304, the vital points in the advance line held by the French west of the Meuse. In the first week of May the battle flamed out again. On the west bank of the Meuse the combatants struggled throughout the month of May and the greater part of June for the possession of Le Mort Homme and the positions at Hill 304 and Avocourt Wood to the westward. East of the Meuse the Germans attacked all points but made their main efforts upon Thiaumont, Douaumont and Vaux. The battle began west of the Meuse with an attack on Le Mort Homme, the highest point on a long and rolling north-and-south ridge, lying between the broad valley of the Meuse on the east and Esnes rivulet, which separates it on the west from Hill 304. After sweeping Le Mort Homme for three days and nights with artillery fire, the German infantry gained a footing on the ridge, but they were compelled to withdraw on May 10. They next sought to turn Le Mort Homme by an attack on Avocourt Wood, which they assaulted on May 17. After a three days' bombardment they assaulted Le Mort Homme again on the 20th from two sides and succeeded in establishing themselves on the northern face after the most deadly struggle of the war. On the 22d they made 16 assaults between Avocourt Wood and the Meuse. By the 23rd they had established themselves at the base of Hill 304, but the French held the western slopes; and on the 24th they drove the French out of Cumières. At 3 o'clock in the afternoon of May 28, after 12 hours of the heaviest concentration of artillery fire that had been seen on the western front, five fresh German divisions assaulted the French lines between Le Mort Homme and Cumières. This attack failed and the Germans were still struggling in front of this line on July 1, when the great Anglo-French offensive on the Somme (see *infra*) relieved the pressure on Verdun.

On May 22d the French, under the direction of General Nivelle, who had succeeded General Petain in command at Verdun early in May, reopened the battle east of the Meuse by surprising and recapturing Douaumont fort. The German counter-attack was quick and vigorous. After

many futile assaults on the 22d and 23d, two fresh Bavarian divisions finally retook the ruins of the fort on the 24th. On May 31 the Germans began a terrific bombardment of Fort Vaux, upon which they had rained a daily average of 8,000 heavy shells since March. The German barrage fire cut off all communication with the fort and the little garrison of about 500 men under Major Raynal suffered severely for water. Raynal held out until June 6 when "columns of smoke and explosions in what was once the fort" of Vaux were observed from the French lines. For the gallantry of his defense the German Crown Prince permitted Major Raynal to retain his sword, and the French Republic made him a commander of the Legion of Honor. After an interval of comparative repose, the Germans on June 19 began a regular attack upon Ridge 321, Thiaumont work, and Fleury on a three-mile front. On June 23 a hundred thousand men were hurled at this short line. At 2 o'clock in the afternoon the Germans captured the Thiaumont position. On the 25th they got possession of Fleury but they were promptly met by fierce counter-attacks which stayed their further progress. This was the situation when the outburst of the British bombardment on the Somme relieved the pressure on Verdun and reduced the Germans to the defensive on the western front.

After an intense artillery preparation the French launched an infantry attack on a 4½ mile front east of the Meuse at 11:40 a. m. on Oct. 24, and advanced their lines to a maximum depth of nearly two miles. They captured the village and fort of Douaumont and the quarries of Haudromont, and in seven hours regained practically all the ground lost east of the Meuse since Feb. 25. They captured 3,500 prisoners, which were increased within a few days to 5,000. They repulsed many counter-attacks and continued to gain ground for several days. Next they began operations against Fort Vaux, which was evacuated by the Germans on Nov. 2 on account of the severity of the French artillery fire.

At 10 a. m. on Dec. 15, the French, after several days of artillery preparation, launched an attack east of the Meuse, between the river and the Woevre, pierced the German lines to a depth of two miles on a front of 6¼ miles, and drove the Germans back to the positions which they occupied on Feb. 23, after the first two days of the battle of Verdun. They took Vacherauville and Louvemont, Chambrette farm, Hardaumont, and Besonvaux, and captured 284 officers, 11,103 men, 115 guns, 107 machine guns, and 44 mine throwers. In their advance the French turned Talou and Pepper ridges, and when the Germans found their retreat cut off, they surrendered in large numbers.

The Battle of the Somme.—The long expected British-French offensive began on July 1, north and south of the River Somme, against the westernmost German salient. It was preceded by five days of heavy bombardment on a broad front, by night raids of small parties to ascertain the effect of the bombardment, and by attacks on German air craft. The British front of 90 miles was one blaze of artillery. The bombardment was heaviest near Ypres, in the Loos sector, and on the Somme. On the first day 15 German observation balloons were attacked and six were brought down. The Allies' aeroplanes bombed German headquarters and railway stations. They soon attained a complete mastery of the air in the sector selected for attack, and the concentration of their troops was effected in secrecy. In a general way the objective of the British was Baupaume and that of the French Péronne. Their immediate objective was the dominating ridge extending from Thiépval to Combles. Gen. Sir Henry Rawlinson was in command of the British and General Foch was in command of the French forces detailed for the attack. The advance was set for 7:30 a. m. on July 1. The British attacked on a front of 20 miles in a country of chalk downs and woods on either side of the River Ancre and to the north of the Somme and broke through the German first lines on a front of 16 miles. The French left joined the British right. They attacked on a front of three miles on the north side of the Somme, and on a five-mile front south of the river. The British

occupied La Boisselle, Mametz, Montauban, and part of Serre and Contalmaison on the first day; while the French took Dompierre, Becquincourt, Bussu, and Fay. In the face of obstinate resistance, chiefly from machine guns in positions sheltered from artillery fire, and of many counter-attacks, the Allies continued their advance on the 2d. The British took Fricourt and the French, Curlu and Frise. The French advance was most rapid south of the Somme, where, on a front of 6 miles, they advanced eastwards to a depth from 2½ to 3½ miles. They encountered comparatively slight resistance, as the Germans, believing that they were exhausted by their efforts at Verdun, had not expected them to attack. By 2 o'clock on the 2d the British had captured 3,500 prisoners and the French 6,000. On the 3d the French captured Herbecourt, Feuillères, Flaucourt, and Assevilliers and reached the outskirts of Estrées, adding about three miles to their gains, which placed them within three miles of Péronne. The British advance over a wider front was not so fast and at some points the Germans drove them back slightly. The survivors of a Prussian infantry battalion numbering 20 officers and 600 men surrendered to the British near Fricourt on the 3d.

Heavy thunderstorms broke over the Somme valley on the 4th and interfered with the operations. Nevertheless the French made considerable gains. The Germans received large reinforcements and made determined but unsuccessful efforts against the British in the vicinity of La Boisselle. On the 5th the whole of the German second line was in French hands on a front of 6¼ miles. By the 6th the unwounded Germans taken by the French numbered 9,500; by the British 6,000. The Germans by this time had moved their railhead back to Cartigny, four miles east of Péronne. On the 7th the third Division of the Prussian Guard was put into the battle against the British east of Contalmaison, but it was thrown back, broken and defeated, with the loss of 700 prisoners. On the 9th the French attacked on a front of nine miles from Maricourt to Estrées. In attacking the French blotted out the first line trenches with heavy artillery; then the 75's plastered the rear and lateral approaches with shrapnel, while raiding parties went forward to ascertain the damage and signal back to the main body. As a result the French losses were surprisingly small. On the 11th General Haig reported that after 10 days and nights of continuous fighting, the British were in possession of 14,000 yds. of the German first system of defenses. They had captured 26 field guns, one naval and one anti-aircraft gun, a heavy howitzer, and 7,500 prisoners. On this day the Germans, having received large reinforcements, attacked the British all along the line and gained some ground in Mametz and Trones Wood, which they had again lost by the following day.

At daybreak (3:25 a.m.) on the 14th the British attacked the German second line on a four-mile front, carried it, and held it against strong counter-attacks. They took Bazentin-le-Petit, Bazentin-le-Grand, Longueval, and a great part of Orvillers, and completed the occupation of Trones Wood. Within the next three days they captured 17 heavy and 37 field guns and increased their prisoners to 10,000. The French captures to date amounted to 11,976 officers and men, 26 bomb throwers, and 85 guns. On the night of the 18th the Germans launched a determined counter-attack against the British. They gained a foothold in Longueval and in Delville Wood, but their success was short-lived. The British soon recovered the lost ground and their artillery dispersed the massed German reserves. The French advanced on a front of six miles in a southeast direction on the 20th, captured 2,900 prisoners, and held their gains. The British began an attack along the whole front from Pozières to Guillemont shortly after midnight on the morning of the 22d. They captured most of the defenses of Pozières. The village itself fell into their hands on the 26th. By this time they had established themselves in the German second lines on a front of over 9,000 yds. and had taken more than 24 sq. miles of their enemy's ground. The French made important advances in a series

of fights north of the Somme on the 30th. They went forward on a front extending from Hardecourt to the Somme at Hem and reached the outskirts of the village of Maurepas, south of Combles.

From the beginning of the battle of the Somme the Germans were subjected to an artillery fire that was much superior to their own. The Allies drove a wedge into the German lines which gradually widened as it was driven home by a steady methodical advance. They had followed up their first great attack with an increasing intensity upon a constantly widening front. Throughout the month of July there was a continuous series of intense and concentrated struggles for small positions. The operations at times rivalled those at Verdun. In the beginning the Germans concentrated their forces against the British in the belief that the operations of the French were of minor importance. Between the 1st and the 13th of July the British shattered the whole of the German first line over a front of 10,000 yds. By the 25th they had taken the second line. This left them below but close to the crest of the ridge upon whose western slope the Germans had established their positions. They then began to creep steadily up the slope and over "the bare, shell-swept summit of the ridge." German estimates placed the losses of the Allies during the month at 350,000. The Allies estimated the German losses at 650,000.

In the first week of August the British made progress north of Pozières in capturing the German main second-line trenches, and the French went forward north of the Somme. The British continued to make slow but steady gains during the second week of August. In the third week the Allies captured many strong positions and miles of trenches. Thiepval, Martinpuich, Guillemont, and Maurepas constituted veritable fortresses along the German line. The Allies pushed out salients between these fortresses so as to surround them and subject them to a concentrated fire. On the 11th the French began an attack on Maurepas by seizing the trenches on a ridge south of the village. On the 12th they entered the village and captured the church and cemetery. French and British troops next attacked north of the village and reached the Maurepas-Guillemont road. Alternate attacks to the north and south of the village were continued until the 24th, when they carried the village and established their front of over a mile 200 yds. beyond the village. On the 12th the French attacked the German third line on a four-mile front from the east of Hardecourt to the Somme opposite Buscourt and overran it to a depth from 660 to 1,100 yds. They captured 1,000 prisoners. The British gained from 200 to 600 yds. on a six-mile front on the 19th. By the end of the month the British captures amounted to 15,469 prisoners, 86 guns, and 160 machine guns. The Germans announced on the 16th that the British and French had gained ground to a depth of three to five miles over a front of about 18 miles but nowhere had they been able to break through. They stated that the Allies frequently fired 90,000 shells within an hour and more than 1,000,000 within 24 hours.

The Allies made a joint attack on Sept. 3. The British took Guillemont, the most powerful German position in the neighborhood of the Somme, and part of Ginchy, and advanced their front 500 yds. east of Guillemont. The French attacked from north of Maurepas to the Somme on a front of four miles, took the village of Forest and the trenches north of it to the outskirts of Combles, repulsed a large German counter-attack, and captured 2,000 prisoners. To the south they captured Clery. They widened their zone and attacked on a front of 12 miles by extending to the southwest of Chaulnes on the 4th. The Allies were now attacking upon a 40-mile front, and the area of constant fighting now took in a seventh of the western front between Switzerland and the North Sea. By the 6th the British held the German second line from Mouquet farm to the point where their line joined the French line. In three days the Allies had taken 7,000 prisoners. The Germans estimated that 28 British and French divisions were engaged in these operations.

The French resumed the offensive from Combles to the Somme on the 11th and took the German advanced trenches within a half-hour with 1,500 prisoners. They drove a broad wedge between the German positions of Combles and Péronne, and by the capture of Bouchavesnes advanced entirely through the German defensive system as it had existed on July 1.

The British began an attack upon the German positions southeast of Thiépval on the night of Sept. 14, and took 1,000 yds. of trench. The battle was continued on the 15th on a front of six miles. The British first used with great success a new type of heavy armored landship, or movable fort, the famous "tank." By night the British gains amounted to one or two miles on a front of six miles, and they had taken Courcelette, Martinpuich, and Flers and captured 4,300 prisoners. The German losses were increased by the fact that they were in the midst of a counter-attack at one part of the line when the British offensive began and were massing troops in their front trenches. Between the 17th and 19th the French captured Vermandovillers, Deniécourt, and Berny with 1,600 prisoners. On the 20th the Germans delivered heavy counter-attacks against the French north of the Somme. The Allies resumed their offensive on the 21st against Thiépval and Combles. On the 26th the British took Thiépval and the ridge overlooking the Ancre on the left, and, in conjunction with the French, Combles. The British took also the famous Hohenzollern Redoubt, with its elaborate system of defenses, and advanced to a depth of more than a mile on a front of six miles, between Combles and Martinpuich. On the 27th the British placed themselves firmly on the ridge northeast of Thiépval, stormed the Stuff Redoubt, 2,000 yds. from that village, and took 2,000 yds. of trenches north of Flers. The French penetrated the St. Pierre Vaast Wood, east of Rancourt. On the 28th the British took the Schwaben Redoubt, 500 yds. north of Thiépval, from which artillery can observe and dominate the entire northern valley of the Ancre.

Rain impeded operations on the Somme in the first week of October. On October 7 the British advanced their lines by 1,200 yds. on an 8-mile front and captured Le Sars, a village on the Albert-Bapaume road. The weather throughout November was unfavorable for operations on the western front and the battlefield was "a wilderness of mud." On the 12th the French took Saillisel, one of the most stubbornly defended of the German strongholds north of the Somme, and broke into the fourth line of the German defensive system. On Nov. 13, after a brief bombardment, the British attacked the German lines astride the River Ancre, the main weight of the attack being to the north of the river, and broke through to an average depth of 1,000 to 1,200 yds. on a front of five miles. The briefness of the bombardment came as a surprise and the British met little opposition until they reached the fourth line of trenches. They captured the entire front system on a stretch of 3,000 yds., to an average depth of one mile, took the fortified villages of St. Pierre Divion and Beaumont-Hamel, and captured 5,000 prisoners. A thick mist prevailed when they went to the assault.

With this success the battle of the Somme ended. The remainder of November and the month of December were marked by fierce bombardments and many trench raids, but no movement measurable upon the map took place on any part of the line.

Between July 1 and Nov. 1 the Allies captured 71,532 German soldiers, 1,449 officers, 173 field guns, 130 heavy guns, 215 trench mortars, and 981 machine guns. The share of the French amounted to 40,796 men, 809 officers, 77 field guns, 101 heavy guns, 104 trench mortars, and 535 machine guns.

A French "official statement," issued in December, placed the German losses on the Somme between July 1 and Nov. 1 at "over 700,000."

The Italian Front.—On the Italian front the war languished during the first months of 1916. Snow covered the mountains and valleys and mist prevented the effective use of artillery. Both sides experienced great difficulty in supplying their troops at the high altitudes occupied by the lines along a great part of the battle front. In

March the Italians carried out great bombardments on the Isonzo front in order to prevent reinforcements of men and guns from being sent to Verdun. Meanwhile the Austrians were preparing for a great offensive in the Trentino. In November, 1915, they began to reinforce their Trentino front with troops from Russia. The Italians were aware that reinforcements were being sent to the Trentino, but they were misled by the secrecy of the Austrian preparations, and when the great Austrian offensive broke loose, they were ill prepared to meet it. They had neglected to fortify their positions and reserves of artillery and infantry were lacking. On May 14 the Austrians began a heavy bombardment from Val Giudicaria to the sea. On the 15th massed infantry attacks were begun in the 90° sector, which is marked by the valley of the Brenta, running approximately east from Trent, and the valley of the Adige, running approximately south from that place. The Italian lines ran from the vicinity of Rovereto, on the Adige, east along the Val Terragnolo to Monte Maronia, thence northeast to Soglio d'Aspio, thence east and northeast to Cima Manderiolo, and thence north across the Brenta to Monte Collo, which lies northwest of Borgo on the Brenta. The Italian positions were good for offensive operations against the Austrian line, but, in general, they were bad by nature for defensive purposes. The Austrians had concentrated great forces of artillery and infantry at Trent, whence excellent roads lead east, southeast, and south to the Italian positions. Railways run east from Trent along the valley of the Brenta and south along the valley of the Adige. Late in April General Cadorna, the Italian commander-in-chief, moved his headquarters to the First Army, which held the threatened front, and within a few days he relieved General Brusati, who commanded the First Army, and appointed General Pecori-Giraldi in his stead. The Austrians had concentrated 2,000 guns, of which 800 were of heavy calibre, including 40 12-inch Skoda howitzers. The attacking force consisted of 15 divisions numbering 350,000 men. It soon became evident, from the concentration of Austrian guns, that the main drive was to be made in the center, to the southeast towards Asiero and Asiago. The first actual advances were made on the wings, at Zugna Torea, south of Rovereto, on May 18, and at the Armentera ridge near Borgo on the 20th. Meanwhile the Austrian artillery had been deluging the Italian center with shells. On the 18th the Italians evacuated the line from Monte Maggion to Soglio d'Aspio. Southward they fell back to Coni Zugna and Pasubio, where they prepared to make a determined stand. On the 20th General Cadorna decided to withdraw his center. The withdrawal began on the 21st, and on the same day he gave orders for the formation of a new army to support his center. This army was assembled in place on June 2. The Italian wings held firmly; the center withdrew slowly in the presence of superior forces; and on June 3 General Cadorna announced that the Austrian offensive had been stopped all along the line. Nowhere had it reached the Venetian plain. The Italians continued upon the defensive for a fortnight longer. Their lines continued to fall back in the Sette Comuni, but they lost no important position. On June 2, 3, 4, and 5, the Austrians made heavy infantry attacks. On the 12th they began a heavy bombardment and attacked all along the line. These attacks were repeated on the 13th. The Austrians made sporadic attacks until the 17th along various parts of the line, but three Austrian divisions had already been sent to meet the Russian offensive in Galicia (see *infra*), and the Austrian offensive was over.

The Italians now began to feel the Austrian lines as a preliminary to an advance, and they began an intense bombardment from the Adige to the Brenta. On June 16 the Italian right moved forward and made important captures. On June 25 the Austrian retreat began. They had selected a very strong line which ran from Rovereto *via* Col Santo, Barcola Pass, Monte Maggion, Asiero Plateau Monte Meatta, and Portule to the frontier. The Austrians withdrew their artillery and protected their re-

treat with strong rear guards. The Italians pressed forward and captured large numbers of prisoners and machine guns. The Austrians had failed in the main object of their offensive; they had lost 150,000 men, according to Allied reports; but they had secured a stronger line than that which they held at the beginning of the campaign. On May 31 Austrian reports stated that 30,388 prisoners, including 694 officers, and 299 guns, had been taken from the Italians. They claimed that the Italian losses amounted to 80,000. In June the Austrians took 9,700 prisoners and five guns.

The Austrian offensive in the Trentino delayed the Italian offensive on the Isonzo, which was planned to take place in concert with the Franco-British offensive on the Somme and the Russian attack in Galicia. The Isonzo front extended from Plezzo on the upper Isonzo to the sea. The Austrians were well entrenched along this river, in many lines of works. They held the right bank at a bend of the river south of Tolomino and at Gorizia; the Italians held the left bank from Plezzo to the vicinity of Tolomino, the bend at Plava, and the crest of the Carso from opposite Gradisco to the Adriatic. Gorizia was protected by Monte Sabotino (2,000 ft. high) and the hogback of Podgora (800 ft.), which lie west of the Isonzo and which were linked together by trenches and heavily fortified. The Italians began their attack on the Lower Isonzo on Aug. 6. Gorizia was virtually in their possession on the evening of the 8th, when the fortified barriers west of the city were taken by assault. On the 9th they entered Gorizia, the goal of the Isonzo army's aspiration since the beginning of the war. By nightfall the Italians had crossed the river and were in full pursuit of the Austrians, while their engineers were throwing bridges across the stream. They were carrying on a methodical offensive from Plava, north of Gorizia to the Adriatic, a distance of 20 miles. Gorizia and its vicinity were cleared so thoroughly of the Austrians that the King of Italy entered the town at the head of detachments of cavalry on the 10th. The Italian War Office announced on the 11th that the entire Doberdo plateau, which lies southwest of Gorizia and forms the west extremity of the Carso plateau, had been taken by the Italians. The prisoners taken to Aug. 12 numbered 268 officers and 12,072 men. The Italians continued to advance and take prisoners until Aug. 17, when their offensive came to a standstill.

On Oct. 11 the Italians assumed the offensive in the Carso region, captured several lines of Austrian trenches and took 5,000 prisoners. On the 12th they repulsed several Austrian counter-attacks and pushed their advance forward. The number of prisoners taken in the two days' battle was 6,805. Since Aug. 6 the Italians had taken 30,881 prisoners. On the 13th they took the Austrian second line of defense on the Carso. On Oct. 28 an immense artillery preparation was in progress east of Gorizia and on the Carso plateau, and on Nov. 1 General Cadorna began a new offensive. He advanced his lines east of Gorizia on a six-mile front to a depth of 500 to 1,000 yds. and captured 4,731 prisoners. On the second day the Italian attack swept on along a 15-mile front from Gorizia to the Adriatic and increased the number of their prisoners to 8,200. They carried their lines forward 1½ to two miles. At the end of four days bad weather caused a slackening in the operations, when the Italians had taken over 9,000 prisoners and 20 guns. By the 6th the Italian artillery was within range of Castagnavizza, the important central road point on the Carso plateau.

The Russian Front.—The great eastern advance of the Central Powers in the summer of 1915 had spent itself and the counter-attacks of the Russians had come to a standstill by the end of September, 1915. The Austro-Germans had gone far, but they had been unable to attain the line Riga-Dvinsk-Minsk-Luniets-Rovno-Tarnapol-Podolski, which would have deprived the Russians of a strong line of defense and excellent lateral railway communications and the power of taking the initiative in future operations; for the possessor of this line, other things being equal, would have the power of the initiative in future operations.

At the beginning of 1916 the Russians held a line in front of the railway, extending from the Gulf of Riga to the frontier of Rumania, 700 miles in length. On this line the Russians easily frustrated every attempt of the Central Powers, whose forces had long since reached a maximum, to resume the offensive, between October, 1915, and June, 1916, when they themselves were ready to deliver their great attack south of the Pripet. The lull on the eastern front was interrupted by many local encounters and by two Russian drives of more than local importance, the first south of the Pripet in December and January, and the second toward Vilna in March. The Germans had taken the important railway centers of Vilna and Baranovitche north of the Pripet Marshes, and the Austrians had taken the equally important junction of Kovel south of the Marshes, but the Russians retained the railway across the Marshes. In January the Russians estimated the Austro-German forces opposed to them at 120 infantry and 23 cavalry divisions. The first section, which extended from the Gulf of Riga to the Upper Niemen, was under von Hindenburg; the second section, which extended thence to the Pripet, was under Prince Leopold of Bavaria; the third section, which extended to the Ilkva, was under General von Linsingen; and the fourth section, which extended to the Rumanian frontier, was under the Austrian Archduke Frederick.

On Dec. 23, 1915, the Russians began an offensive, which lasted until the middle of January, along the southern part of the eastern front, in order to distract attention from the massing of troops in the Caucasus for the campaign of the Grand Duke Nicholas against Erzerum, which began in January (see *infra*). Fierce fighting took place on the Bukowina frontier and along the Strypa and Styr rivers. At the close of this midwinter battle in Galicia, the forces stood practically where they were at the beginning. The loss on each side was probably about 75,000 men. On Feb. 9 the Russians took the bridgehead of Ustsictchko on the Dniester which opened the important region between that river and the Pruth.

In order to relieve the pressure at Verdun and to forestall a similar great offensive which was expected on the Riga-Dwina front, the Russians on March 16 began a drive against Vilna, the most important strategic point in German hands north of the Pripet. Three Russian corps and a cavalry division attacked along the Bereswetsh-Svientsiany railway, northeast of Vilna, and a second force of about equal strength attacked a short distance to the south. The Russians began a bombardment of the German lines on March 16, but the Germans made counter infantry attacks on the 17th before the Russians were ready to launch their infantry. The German attacks were repulsed, and the Russians made slight progress within the next few days. In the last days of March the thaw put an end to offensive movements. Late in April the Germans attacked the Russian lines and regained all that they had lost in March.

When the Russian offensive began in June, General Alexieff, under the direction of the Czar, controlled the Russian forces in the field. The armies between the Baltic and Rumania were divided into three groups. The Right, under General Kuropatkin, consisting of the Twelfth Army, General Gorbatowski, Fifth Army and First Army, General Litvinoff, and aggregating, according to German estimates, from 35 to 41 divisions and 13½ cavalry divisions, extended from the Baltic to the valley of the Dusna. The Center, under General Evert, consisting of the Second Army, General Smirnoff, Tenth Army, General Radkievitch, Fourth Army, General Rogoza, and Third Army, General Lesh, and aggregating from 42½ to 50½ divisions and 8½ cavalry divisions, extended from the valley of the Dusna to the northern outskirts of the Pripet Marshes. The Left, under General Brusiloff, consisting of the Eighth Army, General Kaledin, Eleventh Army, General Sakharoff, Seventh Army, General Shcherbatieff, and Ninth Army, General Lechitsky, and aggregating 41 divisions and 14 cavalry divisions, extended from the Pripet Marshes to Rumania. Towards the end of June Lesh's Third Army was transferred to Brusiloff's group.

The Pripet Marshes marked roughly the division between the German and Austrian armies, one Austrian corps being to the north, and a few German divisions and two German commanders south of the Pripet. The German front was divided into two groups of very unequal strength. The first group under Field-Marshal von Hindenburg extended from the Baltic to the Niemen. It consisted of an army of one cavalry and 7½ infantry divisions, according to Allied estimates, extending from the Baltic to Friedrichstadt; the Eighth Army of nine infantry and three cavalry divisions under General von Scholtz, extending thence to the vicinity of Vidzy; the Tenth Army of 11½ infantry and four cavalry divisions, under General von Eichhorn, extending thence to the Upper Vilia; and the Twelfth Army of eight divisions under General von Fabeck extending thence to the Niemen. The duty of defending Vilna fell to Eichhorn's Tenth Army. Prince Leopold of Bavaria commanded the second group, which covered the interval between the Niemen and the Pripet. It consisted of the Ninth Army under General von Woyrsch of eight German infantry divisions and an Austro-Hungarian corps and an army detachment of three infantry and two cavalry divisions on duty in the Marshes. The German forces north of the Pripet appear to have been 47 infantry and 10 cavalry divisions of a probable strength of 1,200,000 men, besides an Austro-Hungarian corps. The forces south of the Marshes were under the command of the Archduke Frederick. First came the Third Austro-Hungarian Army under General Puhallo von Brlog between the Marshes and Tchartoryisk, and the Fourth Army under the Archduke Joseph Ferdinand which held Lutsk and Dubno. These two armies numbered 12½ infantry and seven cavalry divisions, besides a division of Poles. The army of General von Linsingen appears to have joined these armies later, when they came under the command of Linsingen. Next lay the Second Austro-Hungarian Army of eight divisions under General von Boehm-Ermolli. On the extreme right were the two armies of Count Bothmer and General von Pflanzer-Baltin, consisting of 20 Austro-Hungarian infantry and four Austro-Hungarian cavalry divisions, and two German infantry divisions. The armies under the Archduke Frederick aggregated about 38 Austro-Hungarian and three German infantry divisions and 11 cavalry divisions. His lines had been elaborately fortified, and an excellent system of field railways had been built. In general there were five lines of trenches, many of them reaching a depth of 20 ft. In the Marshes, breastworks took the place of trenches. As far as possible Slav, Czech, and Ruthenian regiments had been sent to the Italian front, while Magyars, Germans, Italians, and Poles were sent to fight the Russians; but the presence of many unwilling soldiers in the Austro-Hungarian ranks led to the surrender of units *en masse*. It was undoubtedly for this reason that the Russians chose the lines south of the Pripet for their offensive. The Austrian front lines were strong, but their reserves of artillery and infantry had been withdrawn for their offensive against the Italians, and the German reserves had been consumed in the holocaust at Verdun.

The Russian offensive began with simultaneous attacks upon selected sectors along the entire 250-mile line south of the Pripet. It met with unexpected success at the end of two or three days in front of Lutsk, near Butchatch, and between the Dniester and the Pruth. The armies of the Archduke Ferdinand and von Pflanzer-Baltin had suffered disaster. The Russians resolved to push their advantages in the vicinity of Lutsk and between the Dniester and the Pruth, which would lead to advances against the important centers of Kovel and Stanislow. The offensive at Butchatch was to be pushed only so far as it was necessary to protect the movement south of the Dniester, which was pressed most vigorously during the first month of the offensive because the flanks of the attacking forces were protected by the two rivers and success here would cut a line of retreat of the Austrian forces to the northward. On the first day (June 4) General Brusiloff took 13,000 prisoners. By noon of the third day he

had captured 900 officers, 40,000 men, 77 guns, 134 machine guns, and 49 trench mortars.

By June 10 347 officers, one general, 18,000 men and 10 guns had been taken south of the Dniester. On the 13th the Russians made their third entry into Sniatyn since the war began, and the number of their prisoners south of the Dniester had swelled to 754 officers, 37,832 men, 120 machine guns, 49 guns, 21 trench mortars and 11 bomb throwers. The greater part of von Pflanzer-Baltin's army withdrew south of the Pruth, and began to retire on the Carpathian passes. On the 16th the Russians began to cross the Pruth; on the 17th they entered Czernowitz, which lies south of the river; and on the 21st they entered Radautz, 30 miles south of Czernowitz. The troops which crossed the Pruth rapidly overran the Bukowina. Meanwhile, that part of Pflanzer-Baltin's army which had retired westward between the Dniester and the Pruth, came under the command of Count von Bothmer. The Russians pursued, and on June 29 entered Kolomea, one of the immediate objectives of the campaign.

In the Butchatch sector the Russians on June 8 captured the city of that name, which is only a few miles east of Stanislow. After a week of substantial progress the advance was halted to await the advance south of the Dniester. After the fall of Stanislow the offensive north of the Dniester was resumed in July, in conjunction with the advance south of that river.

The success of the Russians against the Fourth Austro-Hungarian Army under the Archduke Joseph Ferdinand in front of Lutsk was rapid and overwhelming. They entered Lutsk, more than 20 miles from their original positions, on the evening of June 6. Large bodies of Austro-Hungarians were cut off and captured. On the 8th the Russians reached the Styr and Ikva at several places and began to cross. On the same day Austro-Germans began to arrive from the region north of the Marshes. They were followed by Germans from the Dwina front and Verdun and by Austrians from the Trentino and the Balkans. Von Linsingen was given command of the troops and General von Ludendorff, von Hindenburg's Chief of Staff, came to straighten out affairs on the Volhynian front and prevent the fall of Kovel, which would sever the northern and southern armies. On the 8th the Russians captured Dubno, at the south end of the salient, and on the 13th they reached Kozin, 18 miles southwest of Dubno. On the 12th they had reached Torchin, 18 miles west of Lutsk; and on the 16th they had driven a circular salient into the Austro-German lines having a radius of 45 miles. In 12 days General Kaledin had taken 1,309 officers, 70,000 men, 83 guns, and 236 machine guns.

On June 16 the Germanic allies began a counter offensive around the entire Lutsk salient. The Germans attacked southeast, along the railway, from Kovel against the northwest face of the salient, and the Austrians attacked northeast from Lemburg against the west and southwest face of the salient. The Germans compelled the Russians to retire five miles on the west and the Austrians flattened out the southwest face to a smaller extent. The fury of the attack died away to the 24th, when it was renewed. In the last days of the month the Austro-Germans attacked on the north and west faces of the salient in anticipation of a Russian offensive which was planned for July 4 near Kolki, at the extreme north of the salient. According to a Russian *communiqué*, General Brusiloff's armies had captured 4,031 officers, 194,041 men, 219 guns, 644 machine guns, and 196 bomb mortars. The armies of the Archduke Ferdinand and General von Pflanzer-Baltin's had lost more than half of their effectives. It has been estimated that the losses of the Germanic allies on the eastern front were equal to that of the Germans in 130 days of desperate fighting at Verdun.

The Invasion of Galicia.—The Russians had driven two salients into the Austro-German lines, the Lutsk salient in Volhynia and the Dniester-Pruth-Butchatch salient in Bukowina. The German lines were practically intact on Count von Bothmer's front of 40 miles between the two salients and farther north between the Lutsk sali-

ent and the Pripet Marshes. Early in July the Russians renewed their offensive with the object of straightening their lines and pushing them farther into Galicia. As von Bothmer held the bridges across the Dniester and as his railway communications to the west were excellent, he was able to hold his positions to the last moment. General Lesh's Army was brought to the south side of the Marshes in June, and on July 4 he began a vigorous offensive north of the Lutsk salient along the Sarny-Kovel railway towards Kovel. In four days he defeated Puhallo's Austro-Hungarian army along a front of 35 to 40 miles, and pushed it back 25 miles from the Styr to the Stokhod, taking 300 officers and 12,000 unwounded men and 45 guns. The right of the Russian line was straightened and carried abreast the head of the Lutsk salient.

The Austro-Germans were preparing for a counter-offensive against the south face of the Lutsk salient, which was to begin on July 18, when General Sakharoff on July 16 forestalled the Germans and began to attack. On the first day immense quantities of ammunition were taken, besides 317 officers, 12,367 men and 30 guns, and by the 17th all hope for a German offensive was destroyed. After a lull the battle was renewed, between July 20-22, and the Russians crossed the Lipa, near the knuckle where the Lutsk salient joined the unbroken line on the south, and captured Berestechko. The Austrians had already begun to evacuate Brody, 17 miles south of Berestechko. At 1:30 a. m. on the morning of the 25th, General Sakharoff began attacks in three directions for the possession of Brody, and at 6:30 a. m. on the 28th, his troops entered the city, having captured 940 officers, 39,152 men and 49 guns, since the 16th. Sakharoff's troops now faced the Krasne-Tarnapol railway on a front of 50 miles at distances varying from 10 to 20 miles from the railway, which was an essential line of communications of the army of Count von Bothmer to the southward. On Aug. 4 Sakharoff opened his offensive to cut the railway. By Aug. 10 his troops had reached Nesterovse, four miles from the railway. This success, taken in connection with the attack of General Lechitsky against the Transversal Railway in Galicia, was fatal to the advanced position of von Bothmer's army.

On June 28 Lechitsky opened a new offensive against the Austrians, whose positions extended from Niezviska to the Carpathians. At the first attack the Austrian lines gave way; the Russians captured 221 officers and 10,285 men; and on the 29th they entered Kolomea and Obertyn, and on the 30th, Pistyn, 12 miles south of Kolomea. On July 2 Count von Bothmer opened a counter offensive on the south bank of the Dniester which made little headway and soon came to a standstill. The Austrians to the west of Kolomea continued to give way, and on July 8 the Russians captured Delatyn and thus cut the railway which leads through the Jablonica pass (Jablonitsa pass) from east Galicia to Transylvania. Between June 23 and July 7, General Lechitsky had captured 674 officers, 30,875 men, 18 guns, and 100 machine guns. Heavy rains now suspended operations.

On Aug. 7 Lechitsky resumed the offensive and captured Tlumatch from the Germans, and on the 10th his troops entered Stanislow and cut Count von Bothmer's communications with the Transversal Railway through Galicia. The troops of General Shcherbacheff were advancing north of the Dniester in concert with Lechitsky's advance south of the river. On the 10th they captured Monastezhyska and crossed the Zlota Lipa near Nizhnioff. These successes and Sakharoff's advance against the Lemberg-Tarnapol railway compelled von Bothmer to retire on Aug. 12 from the Strypa to the Zlota Lipa. Since the Russian offensive began in June, the Russians had captured over 358,000 officers and men, a force about equal to the original Austro-German strength between the Pripet Marshes and the Carpathian Mountains. Many changes had been made in the higher commands in the Austro-German forces. On Aug. 2 von Hindenburg was given supreme command on the entire eastern front, and shortly thereafter the Archduke Karl Franz

Josef, heir-apparent to the Austro-Hungarian monarchy, was called to the command of the three armies of von Bothmer, Kovess, and von Pflanzer-Baltin operating on the Transylvanian frontier.

The German and Austrian resistance between the Pripet Marshes and the Rumanian frontier now tightened and the two Empires made a supreme and successful effort to save Kovel and Lemberg. The Russians continued to press their operations toward these two strongholds and along the Carpathians and the opposing forces became deadlocked. A short lull in the fighting set in about Aug. 20, but there was almost continuous fighting from Aug. 31 until Sept. 19 on the southwestern front. During this period the Russians captured 25,000 men. The Russians made their main efforts in the vicinity of Zloczow, on the direct road to Lemberg, and towards Halicz, on the Dniester. The actual gains of the Russians, except for the capture of prisoners, was small. The Russians kept a constant pressure on the Germanic lines, as a diversion in favor of the Rumanians. Between Sept. 30 and Oct. 6, General Brusiloff captured 8,000 prisoners. The Russians made numerous attacks in the Carpathians in October, November and December in order to relieve the pressure in Rumania, but they were unable to break through the passes.

While General Brusiloff was advancing south of the Pripet, severe fighting took place at Baranovitche, Smorgon and Riga, north of the river. The Russians brought on heavy actions at these places in order to keep in place the 48 infantry and 10 cavalry divisions which held the lines north of the Pripet in the spring of 1916. With the same object in view the stationary parts of the Russian line showed great activity. Baranovitche, an important railway junction north of the Pripet Marshes, was held by the Germans. It lay about eight miles in rear of their lines. The Russians began a severe bombardment of the German lines on June 13, and their infantry attacked at 4 p. m. and won several important points. The attacks were renewed the next day and were followed by German counter-attacks. The battle reached a climax early in July. On July 2 the Russians began a new attack at Karchevo, 22 miles further north. Here they captured over 3,000 prisoners between the 3d and 5th of July and penetrated two miles on a front of 12 miles. On the 9th the battle about Baranovitche began to wane, and on the 14th the Germans began a counter-offensive and met a severe repulse and the battle soon died away. The Germans attacked the Russian lines on the Krevo-Smorgon front near Vilna on the nights of June 5-6 and June 10-11, from June 20 to June 22, and again late in July and early in September, but they made no gains of importance. Shortly after the middle of July the Russians attacked the German lines between Riga and Ikskull and carried them to a depth of one to two miles. Near the coast they carried the German lines at one point to a depth of 12 miles.

Rumania Joins the Allies.—On Sunday, Aug. 27, Rumania published a declaration of war against Austro-Hungary (see III, *International Relations*), the 27th since the war began in Europe, and the Rumanian frontier forces surprised the Austro-Hungarian troops in the Transylvanian passes and drove them back to prepared positions in the rear. Germany, Bulgaria and Turkey immediately declared war on Rumania, and Austrian monitors shelled the Rumanian towns of Verciorova and Turnu-Severin, at the Iron Gates, and Giurgevo lower down the Danube. The main body of the Russian Danube army began to pass south through Rumania on the 29th. It crossed the Danube and marched into the Dobrudja to meet the expected attack of the Turks, Bulgarians and Germans from the south. The Rumanians made haste to invade Transylvania for sentimental and political reasons, with little regard to the military situation in Europe. The Central Powers decided to crush Rumania before she could be succored by Russia, as an object lesson to the small neutral states and to open a new era for economic exploitation.

Rumania is separated from Austria on the north and northwest by the Transylvanian Alps and the Carpathian Mountains, and from Bulgaria on the south by the Danube River, with

the exception of the district known as the Dobrudja lying between the Danube and the Black Sea. The frontier of the Dobrudja on the south was entirely open. In the western part of Rumania the mountains are traversed by the Varciorova (at Orsova), Vulcan, and Roter Turm passes. In north-central Rumania the roads lead over the mountains towards Kronstadt in Transylvania by four passes, named in order from west to east, Torzburg, Predeal (or Tomos), Schanz, and Buzeu. The Kronstadt-Bucharest railway runs through Predeal Pass. Four important passes lead from Transylvania across the Carpathians into eastern Rumania, named in order from south to north: Oitoz, Gyimes, Bekas, and Tolgyes. A railway runs through Gyimes Pass.

On Aug. 29 the German Emperor appointed Field-Marshal von Hindenburg Chief of Staff in place of General von Falkenhayn, who was given command of the Austro-German forces destined to operate against Rumania from the north. In the first week of September the Rumanians made rapid progress in the invasion of Transylvania through the Carpathian passes and along the principal river valleys. In the first five days they penetrated 48 miles into Hungarian territory. By Sept. 4 their advance into Transylvania had slowed up somewhat owing to the difficulty of transporting supplies through the mountains from Rumania. In the third week of September they began to meet with strong opposition, especially north of the Roter Turm and Vulcan passes. On Aug. 30 the Rumanians took Kronstadt, the commercial and manufacturing center of Transylvania, with a population of 41,000, lying only six miles within Austrian territory. On the same day the Austrians evacuated Hermannstadt, the former capital of Transylvania, having a population of 33,000. The Rumanians on the 8th occupied Orsova, just across the Iron Gates of the Danube from Turna Severin, the westernmost point of Rumania. Up to Sept. 24 the Rumanians had taken 48 officers and 6,830 men on the Transylvania front. At the end of the first month of the war they had occupied 7,000 sq. miles of Austrian territory, extending from the neighborhood of Orsova in a northeastern direction and passing a little to the south of Hermannstadt and north of Fogaras and north of the Kelemen Mountains. On Sept. 7 it was announced that the Turks, Germans and Bulgarians under von Mackensen, had captured Tutrakan in the Dobrudja with 20,000 Rumanian prisoners. By the 8th of September the weight of the big Russian army that had crossed the Danube began to be felt in the Dobrudja fighting. The Rumanians evacuated the fortress of Silistria on the Danube 25 miles north of Tutrakan on Sept. 10. It was occupied by Mackensen's forces on the 11th. Mackensen's immediate objectives were the bridgehead at Cernavoda, and Constanza, the great grain and petroleum port, on the Black Sea. In a five days' battle, beginning Sept. 16, the Russians and Rumanians defeated him and drove him southward.

The Conquest of Rumania.—At the beginning of October the Rumanians found themselves assaulted on all fronts and faced with an enemy drive of the same character as the gigantic thrusts that had been directed against the French, Russians, Italians and British at various times during the two preceding years. Their batteries were unable to reach the Teutonic heavy guns, their artillery was frequently destroyed and could afford their infantry little aid, and they were compelled to retire. They had abandoned Kronstadt and had retreated from the whole of Transylvania by Oct. 8, and taken up positions along the mountain frontier to defend their country against a violent onslaught by Falkenhayn's large army. The Rumanian retreat was skillfully managed. The number of prisoners taken by the Germans was not large and the Rumanians turned frequently upon their pursuers, delivered heavy counter-attacks, and captured on one occasion 800 prisoners. In 10 days the Germans had reconquered 5,000 sq. miles of territory that had passed into the hands of the Rumanians. General Berthelot, an able French general, was given command of the Rumanian armies about the middle of October. By Oct. 27 the Germans were in possession of five important

passes, Torzburg and Predeal passes north of Bucharest, Roter Turm and Vulcan northwest of Bucharest, and Gyimes Pass, leading into Moldavia. On Oct. 23 Mackensen captured Constanza, the Rumanian port on the Black Sea, which is the terminus of the railway that crosses the Danube by the great bridge at Cernavoda. After the fall of Constanza the Russians and Rumanians swung back their left in an endeavor to protect the important bridgehead. The Germans reported the capture of 6,768 prisoners and 12 guns. On Oct. 25 Mackensen captured the eastern entrance to the Cernavoda bridge, which had already been destroyed by the Rumanians, and drove some 40 miles beyond the Cernavoda-Constanza railway. Four British and 128 French aeroplanes joined the Rumanians from the Salonica front toward the end of October. At the end of two months the Rumanians had captured 20,000 prisoners. Early in November Mackensen retired to the south under the pressure exerted by General Sakaroff, who assumed command of the Russian and Rumanian forces in the Dobrudja. The Russians reoccupied Topalu, about 25 miles north of Cernavoda. On the 13th Sakharoff held a line about 15 miles north of Cernavoda.

In the extreme north the Russians took over Tolgyves and Bekas passes on the Transylvanian front and pushed forward five miles into Transylvania. At the beginning of November the Germans were exerting pressure in the Predeal, Torzburg, and Roter Turm passes, while the Rumanians were winning in the Vulcan Pass. After their retreat to their mountain frontier the Rumanians won two notable successes, one in the Uzul Valley, and the other in the Vulcan Pass, where they drove back the Bavarians and took 600 prisoners. A German cavalry regiment destroyed its horses in order to prevent them from falling into Rumanian hands. On Nov. 7 the Germans announced that they were progressing favorably southwest of the Roter Turm Pass, where they had captured 10 officers and 1,000 men, 12 miles within Rumanian territory. Bucharest official reports on Nov. 9 stated that von Falkenhayn was making his most violent attack in the Prahova Valley (Predeal Pass), on the main road south from Kronstadt to Bucharest. On that day the Germans were five miles within Rumanian territory at the Predeal Pass and 15 miles at Roter Turm. On the 14th the Germans captured 23 officers and 1,800 men at the Roter Turm and Vulcan passes. On the 15th von Falkenhayn's troops were 13 miles beyond the frontier at the Vulcan Pass, 16 at the Roter Turm, 17 at the Torzburg, and five at the Predeal. On the 17th Falkenhayn had got his heavy guns through Torzburg Pass and he began to attack vigorously. He was 20 miles south of the frontier at Roter Turm and 25 at the Vulcan Pass. On the 18th he began a steady advance south of Torzburg, Vulcan, and Predeal passes and captured 10 officers and 1,500 men at Roter Turm. On the 19th he broke through the Rumanian lines at Vulcan Pass and reached the railway between Orsova and Craiova. His forces spread out on a wide front south of Roter Turm and Torzburg. On the 21st he occupied Craiova, in the Jiul Valley, 70 miles south of Vulcan Pass. He was now forcing his way through a region fairly rich in grain and cattle. South of Roter Turm the Rumanians were still putting up a stiff fight on the 23d. On the 24th the Austrians announced that they had succeeded in crossing the Cerna near Orsova. The Rumanians were retreating eastward toward Slatina and the Aluta river, and Orsova was given up.

About Nov. 24 Mackensen's troops crossed the Danube at several places near Simnitza, which lies southwest of Bucharest and to the east of the mouth of the Aluta. This compelled the Rumanians to abandon the idea of holding the Aluta as a line of defense. The forces of Falkenhayn and Mackensen soon joined and their progress through Rumania was rapid. They met little opposition and captured few prisoners. On the 29th the Rumanian Government and diplomatic representatives left Bucharest for Jassy, near the Russian frontier, 200 miles northeast of Bucharest.

The battle for the defense of Bucharest was fought on the Arges

River about 12 miles southwest of the city on Sunday, Dec. 3. The Rumanians were defeated with the loss of 12,000 prisoners. The forts about the city had been disarmed and no attempt was made at a near defense of the capital. Mackensen's forces entered on Dec. 6 and the German field-marshal laid a contribution upon the inhabitants amounting to $380 a head. On the same day the division which had defended Orsova capitulated on the Aluta River with 8,000 men and 26 guns. General Falkenhayn captured Ploesti, an important city in the oil region about 50 miles north of Bucharest, and cut off and captured, on Dec. 9, 10,000 Rumanian troops that had been defending Predeal Pass. German reports stated that the armies of the Central Powers captured 70,000 prisoners, 184 guns, and 120 machine guns between Dec. 1 and Dec. 11. The Rumanian armies, reinforced by the Russians, withdrew to the northeast. They had avoided definite defeat on a large scale and they were still intact. Meanwhile Russian troops were pouring into eastern Rumania and taking up positions along the Sereth River. The line of the Sereth was provided with a permanent system of fortifications, built in 1887, extending 45 miles across the country from Galatz on the Danube to Focsani at the foot of the mountains. The Russian retirement in the Dobrudja kept pace with the retreat of the troops west of the Danube. At the close of the year the front of active operations was along the Sereth lines, extending from the Oitoz Pass to the Danube, a distance of 120 miles. General Sakharoff's Russian army held a small area in the northern part of the Dobrudja. The armies of the Central Powers were slowly pressing the Russian and Rumanian advance troops back to the Sereth lines and were attempting to capture the port of Braila on the Danube, about 20 miles south of Galatz.

The Macedonian Front.—Early in December, 1915, the Italians landed two divisions at Avlona in Albania and pushed troops forward to Durazzo. In February they evacuated Durazzo, which was occupied by the Austrians on Feb. 26. At the beginning of the year the Austrians were attacking the little kingdom of Montenegro. On Jan. 10 Mount Lovtchen, the fortified height which protected Cettinge, fell into their hands. On the 13th they captured Cettinje and King Nicholas departed for France. On the 23rd the Austrians took Scutari; on the 25th they captured San Giovanni de Medua and moved southward against the Italian fortified lines at Durazzo; and Montenegro became the third small country overrun and devastated by the Teutonic allies.

Before the close of the disastrous campaign in Serbia late in 1915, the Allied statesmen had decided that Saloniki should be held as a base for future operations, to prevent it from falling into German hands and becoming a submarine base, to deprive Austria of her long-cherished dream of an Ægean port, to prevent Greece from joining the Central Powers, and to give the world a visible token of their intention to restore the defeated Serbs to their country. The Allied lines as first selected ran from the Vardar River to the Gulf of Orphano, a distance of 60 miles. At the nearest point they were 10 miles from the city. The defenses were virtually completed by Dec. 25, 1915, and on the 30th enemy aeroplanes appeared and dropped bombs on the city. The remnants of the Serbian army were sent to the island of Corfu, where the war-worn soldiers recuperated after the hardships of a winter campaign, and the Serbian Parliament assembled in the island. The first Serbian contingent arrived at Saloniki in April, to reinforce the Franco-British armies whose strength was estimated at 550,000 men. By July French transports had carried over 100,000 well equipped Serbian soldiers to Saloniki.

On Monday, July 14, the Serbian troops first came into contact with the Bulgarians about six miles south of the northern frontier of Greece, in the district of Moglen, northwest of Vodena. They attacked and carried a series of six heights which had been fortified by the Bulgarians. The Russians landed a contingent of troops at Saloniki on July 30, and the Italians another on Aug. 11. With the arrival of the Russians at Saloniki, the

Russians were fighting in every area of Allied operations from the Caucasus to Champagne with the exception of northern Italy. The Bulgarians invaded Macedonia in July and captured Florina, a small town 16 miles south of Monastir. In the latter part of August the Bulgars occupied the Greek port of Kavala on the Ægean Sea, where the Fourth Greek Army Corps fell into their hands and was sent into Germany for internment until the close of the war (see also *III, International Relations;* and IV, *Greece*).

Early in September the Allies began operations on a semicircular front of 125 miles. On Sept. 7 the Serbians captured a height between Ostrovo and Florina. In the second week of September the British began an offensive to the northeast along a 30-mile front, extending from the Gulf of Orfano through the Tahinos Lake region to Nevolien. With the Serbians on the right and the French and the Russians on the left, the Allies on Sept. 17 began a battle for the possession of Monastir. French troops on the extreme left of the Allied line carried Florina by storm and drove the Bulgarians towards Monastir on Sept. 18. In October the Allies advanced slowly into Serbian territory. The British crossed the Struma on a 20-mile front, cut the railway near Seres on Oct. 11, and advanced on Seres. The Italians attacked the villages due north of Saloniki. The French, Serbians and Russians assaulted the entrenchments in front of Monastir at 1 p. m., on Oct. 14, under the personal direction of General Sarrail, the Allied commander-in-chief. On Oct. 18 and 19 the Allies won important positions and took seven guns and 1,000 prisoners. German reinforcements arrived, and on the 22nd they attempted, in conjunction with the Bulgarians, to retake the lost positions, but failed in the effort. On Nov. 13 the French and Serbians captured the village of Iven and took 16 field guns and large quantities of war material. Since Sept. 14, the Allies had captured 6,000 prisoners, 72 guns, and 53 machine guns. The Allies pressed on and crumpled up the Bulgar-German lines and on the 16th they were within four miles of Monastir. They entered the city at 8 a. m. on Nov. 19, and Monastir was proclaimed the temporary capital of Serbia. The Bulgars and Germans retreated to the northward and took up a line three miles from the city.

Evacuation of the Gallipoli Peninsula.—The New Year found the Entente Allies in the act of evacuating the Gallipoli Peninsula. Historical precedent called for a loss of at least 33 per cent. in such an operation. It was effected with the loss of three men slightly wounded. To increase the difficulties, want of transportation for the large forces involved (three army corps) compelled the Allies to make their evacuation in two instalments: (1) Suvla and Anzac; and (2) Cape Hellas. Working only at night, the material at each place, including the heavy guns, and the greater part of the personnel were removed in about 10 days. Quaker guns replaced the artillery as it was removed, and a few selected battalions of infantry were left until the last night. The Turks were deeply engrossed in emplacing heavy artillery which they had received by rail from Germany. At 3:30 a. m. on Dec. 20, 1915, the last troops left Suvla, with the loss of one man wounded. Two hours later the last transport left Anzac, where two men had been wounded. Following similar methods, Cape Hellas was evacuated without mishap early in January, the last troops leaving on Jan. 9, and five Turkish corps were released for operations in the Caucasus.

The Campaign in the Caucasus.—The Russian army in the Caucasus, normally about 100,000 men, was increased by two army corps near the end of 1915, and additional troops joined in January, 1916. The Turkish forces in the same theater numbered about 150,000. The evacuation of the Gallipoli peninsula in January, which released five Turkish corps for service elsewhere, precipitated an impending Russian attack upon the fortified city of Erzerum. This city lies in a depression of flat ground among the mountains, 6,000 ft. above the sea, on the road from Russia to the richest part of Asiatic Turkey. It is 200 miles southeast of the important port of Trebizond on the Black Sea,

and 440 miles east of the railhead of Angora. The Russian command of the Black Sea restricted the Turks to the long and difficult communication by wagon road to Angora. In three days in January the Russians sank 200 Turkish small vessels on the Black Sea and the total number sunk by the end of February reached 4,000.

For the attack of Erzerum the Russians possessed a good railway which ran from Tiflis *via* Kars to Sarikamish, 80 miles from the fortress. General Yudenitch, who, under the direction of the Grand Duke Nicholas, was in immediate command of the Russian forces, advanced on Erzerum on Jan. 11, in three columns on a front of 70 miles. On Jan. 16 the central column on the Kars-Erzerum road was held up at the bridge over the Araxes at Kuprikeui, 33 miles from Erzerum. A Russian battalion forced the passage of the bridge in a blinding snow storm on the 18th, and three Turkish divisions were driven in utter rout back upon the fortress. By the 26th, when the Russians were ready to attack, the Turkish front had been driven in for 50 miles, three Turkish divisions had been isolated from the main army, and 100,000 men were collected in the fortress. The Russians were not in sufficient numbers to surround it, and a pause ensued until Feb. 12, while they brought up siege guns and ammunition. After a four days' attack, the Turks evacuated the city and the Russians entered on the 16th. They captured 235 officers and 12,753 unwounded men, 323 guns, nine standards, and vast supplies of ammunition and stores. The Russians took the important fortified city of Bitlis near the western end of Lake Van, 110 miles south of Erzerum, on March 2, and thus completed a stage in their advance toward Mesopotamia, as Bitlis commands the road which descends from the Armenian plain to Mesopotamia. Mush, 50 miles from Erzerum, fell on Feb. 18.

Russian troops landed from the fleet on March 4 and captured Atina on the Black Sea coast, 60 miles east of Trebizond, the chief Turkish port at the eastern end of the Black Sea, and the departure point, in peaceful times, of all the great caravans that traverse Asia Minor to the East. The Russian troops, supported by the fleet, took Trebizond on April 18. The garrison retreated with small loss southward towards Genus-Khana and Erzingan. On July 26 the Russians took Erzingan. While their army was concentrated near that town, the Turks took Mush and Bitlis early in August. On Aug. 25 Petrograd reported the recapture of Mush by the Russians. This virtually completed the Russian occupation of Turkish Armenia.

The Siege of Kut-El-Amara.—At the beginning of the year a British army under General Townshend was besieged in Kut-el-Amara, on the Tigris 95 miles below Bagdad and 200 miles above Basra, which lies near the head of the Persian Gulf. This army had advanced to Ctesiphon, 18 miles from Bagdad, in the summer and autumn of 1915; it had been defeated at Ctesiphon, and in its retreat had been surrounded and compelled to stand a siege. General Townshend reached Kut on Dec. 3, 1915. The troops were worn out by their long fighting retreat from Ctesiphon. They were surrounded on the 8th. The Turks made heavy attacks for five days beginning on Dec. 8, and again at Christmas. These attacks were costly and unsuccessful and the Turks settled down to starve out the garrison.

The position at Kut-el-Amara was a peninsula on the left bank of the Tigris, formed by a loop of the river, 3,200 yds. from north to south and 1,700 yds. wide. On the right bank the British held two detached posts. Kut is a place of no resources, but, nevertheless, a large supply of grain was discovered on Jan. 24. The miserable Arab town was full of wounded, for the British suffered 1,840 casualties during the first month of the siege, and the medical supplies failed. Scurvy broke out on Feb. 5. When the Arab inhabitants, who numbered 6,000, attempted to leave the town, they were fired upon by the Turks and driven back, in order to increase the number of mouths to be fed. A relief column under General Aylmer (who was succeeded by General Gorringe) set out from Ali Gharbi on Jan. 6. After many battles it was finally checked at Sanna-i-Yat on

April 23. An attempt to send in a hospital ship with supplies failed on April 24. On April 29 General Townshend, after a gallant resistance of 143 days, surrendered his force, which consisted of 2,970 British troops, 6,000 Indian troops, and 5,000 camp followers. Between April 11 and 29 British aeroplanes dropped 1,800 lb. of food, besides other stores, into Kut.

Defense of the Suez Canal and Egypt.—The secure defense of Egypt and of the Suez Canal has been a cardinal feature in the Allies' strategy. In January, 1915, a Turkish force of about 30,000 men was defeated on the banks of the canal. After the retirement of this force, the British, upon whom devolved the duty of keeping the canal open to world commerce, established a vast system of road and rail communication, collected a great amount of animal transportation, and took as a basis of action the principle that battles for the defense of Egypt should be fought out of sight and beyond the range of artillery from the canal. Throughout 1916 Turkey maintained forces in the vicinity of the canal as a standing menace, but the British kept them at a distance and peaceful commerce was never at any time seriously threatened with warlike interruption.

British aviators bombed a Turkish advance post at El-Hassan, 57 miles east of the city of Suez, on Feb. 20. In March Gen. Sir A. Murray succeeded Gen. Sir J. Maxwell in command of the British forces in Egypt. British aviators attacked and damaged the Turkish advance base at Bir-el-Hassanah, 100 miles east of the Canal, on March 24. On April 23 500 Turks attacked the post of Dudweidar (15 miles from the Canal) and a larger body, estimated at 3,000, with three field guns, attacked Katia village (30 miles from the canal), which was held by a small force of yeomanry. Both of these places are on the northern route across the Sinai Peninsula. The Turks were defeated at Dudweidar, but after a severe engagement the British troops withdrew from Katia. A Turkish division estimated at 14,000 attacked the British position at Romani, a village near the Mediterranean coast, 23 miles east of the canal, on a front of seven or eight miles, at midnight of Aug. 3-4. The Turks made a frontal attack and attempted to outflank the British to the southward. The frontal attack failed and the British made a successful counter-attack against the flanking parties and captured 3,145 prisoners (including 70 Germans) and four guns. The British pursued and on Aug. 9 the Anzac Mounted Division fought a severe battle with the Turks near Bir-el-Abd, the Turkish advance base. The mounted troops kept up a constant pressure upon the Turks until the 12th, when they evacuated Bir-el-Abd.

The British made a systematic advance along the coast road from Katia and Bir-el-Abd, carrying their railway and pipe lines along with them. By a rapid advance from their railhead they captured El Arish, 90 miles east of the Canal on the northern road to Syria, on Dec. 21. The Turks evacuated the town before the arrival of the British and retreated to Magdhaba, 20 miles to the southeast, where, on the 23d, the British captured seven guns and 1,350 prisoners out of a force of 2,000. Simultaneously General Murray's forces occupied Nekhl, in the center of the Sinai peninsula, and British air craft harried Beersheba and other military bases on the Palestine frontier. By these successes all immediate menace to the Canal was removed.

The Conquest of German East Africa.—On Feb. 6, 1916, 900 German and 14,000 native troops reached Spanish Guinea from Cameroon and were disarmed and interned. The capitulation on Feb. 18 of the German garrison of Mora hill, within 100 miles of Lake Chad, in the northern part of Cameroon, completed the conquest of Cameroon.

The German forces in East Africa were reinforced by the crew of the German cruiser *Königsberg* which was destroyed by British monitors in the Rufigi River in July, 1915 (*A. Y. B.*, 1915, p. 157). The Germans, however, were not in great strength in East Africa; they were greatly outnumbered by the British, South African, Indian, Portuguese, and Belgian troops opposed to them, but they had raised a swarm of tribal auxiliaries. Two parallel railways lead from the

coast in a northwesterly direction into German East Africa. The Central Railway runs from Dar-es-Salaam across the central part of the colony to Ujiji on Lake Tanganyika, which lies on the western boundary. Farther north the Tanga Railway, a shorter line, runs from Tanga on the coast to Moshi, near Mount Kilimanjaro on the northern border. Across the boundary line in British East Africa a British railway parallels the two German lines and the boundary between the colonies, running from Mombasa on the coast to Port Florence on Victoria Nyanza.

The main body of the German forces was concentrated between Voi in British East Africa and the Kitovo Hills, on the eastern side of the great mountain of Kilimanjaro in the northeastern part of German East Africa, about 15 miles from the important town of Moshi. They held Taveta in British East Africa. The position of the German forces protected the rich German plantations on the uplands south of Kilimanjaro. Lieutenant-General Smuts, in command of the British forces, advancing from Voi along a branch of the British East African Railway, captured Taveta on March 9, and drove the German advance troops back upon the Kitovo Hills, where a severe battle raged from morning until midnight on March 11. The German native troops broke on the 12th and retreated to the Tanga railway. Moshi fell on the 13th, and the Germans retreated southward along the railway. On the retreat the British captured, at the crossing of the Rufu River, a 4.1-in. gun which had formed part of the armament of the *Königsberg*. On April 6 a British detached force under General Van Deventer captured 15 German and 404 native soldiers in the Arusha district, 40 miles west of Kilimanjaro. On May 25 General Northey advanced from Rhodesia northeast between Lakes Nyasa and Tanganyika. At about the same time forces advanced northward from Portuguese East Africa and eastward from the Belgian Congo, and General Van Deventer established himself at Kondoa Irangi, 100 miles north of the Central Railway. Meanwhile, General Smuts, after being delayed by the seasonal rains, advanced along the Tanga railway upon Wilhelmstal, the central point of a large plantation region. Wilhelmstal fell on June 9. On July 9 General Smuts occupied Tanga, which lies 77 miles south of the British East African port of Mombasa.

After the fall of Wilhelmstal and Tanga the Germans concentrated their forces in the Nguru Hills about 80 miles from the coast opposite Zanzibar. Here General Smuts defeated them between Aug. 9 and Aug. 11 and drove them south towards the Central Railway. On July 29 General Van Deventer occupied Dodoma on the Central Railway and began an advance eastward toward the coast at Dar-es-Salaam. This city, which has a population of 1,000 Europeans and 50,000 natives and is the principal port and seat of government of German East Africa, surrendered on Sept. 4 to a combined land and naval force. The German troops retreated south across the Central Railway and were driven from Kissaki on Sept. 15, where they abandoned 65 European Germans, 34 of whom were sick in a hospital, which was left behind with its entire personnel. The Germans abandoned the greater part of their heavy artillery and retreated, toward the latter part of October, into the region of the lower Rufigi River. Meanwhile the Belgians had overrun the northwest part of the German colony and the Portuguese and General Northey's Rhodesians had driven the Germans out of the extreme southern part of the colony. The central point of the area of German concentration was at Mahenge, which lies about midway between the north end of Lake Nyasa and Dar-es-Salaam. At the close of the year the Germans still held approximately one-fourth of the province, and they were actively opposing the advance of a British force from Kilwa, which lies 135 miles south of Dar-es-Salaam.

V. THE NATIONAL ADMINISTRATION

THE PRESIDENT AND VICE-PRESIDENT

President.—Woodrow Wilson, Democrat, of New Jersey, inaugurated twenty-eighth President of the United States on March 4, 1913, was re-elected on Nov. 7, 1916, for a second term of four years beginning March 4, 1917.

The President and Vice-President are elected for terms of four years by the state electoral colleges, whose membership is based on the Congressional apportionment. This apportionment is revised after each decennial census, as shown in the table in the YEAR BOOK for 1912 (p. 159). The official figures of the popular and electoral votes in the Presidential elections of 1908, 1912, and 1916 are given in the table on pages 170-1. The salary of the President is $75,000, with an allowance of $25,000 for traveling expenses.

Secretary to the President.—Joseph Patrick Tumulty, of New Jersey. The General Deficiency Appropriation Act continues the salary of the Secretary to the President at $7,500 per year, to which it was raised from the statutory amount of $6,000 in 1911 at the request of President Taft.

Vice-President.—Thomas Riley Marshall, Democrat, of Indiana, inaugurated Vice-President of the United States on March 4, 1913, was re-elected on Nov. 7, 1916, for a second term of four years beginning March 4, 1917.

The Vice-President presides over the Senate, with no vote except in case of a tie. His salary is $12,000. The President *pro tempore* of the Senate, who presides in the absence of the Vice-President, is Senator Willard Saulsbury (Del.).

EXECUTIVE DEPARTMENTS

Ten Cabinet officers, constituting the President's advisory council, each in charge of one of the great Departments of the Government, are nominated by the President and confirmed by the Senate, for a term subject to the President's pleasure. The salary of the Cabinet officers is $12,000 each.

With the exception of the Secretary of State (appointed 1915), the Attorney-General (appointed 1914), and the Secretary of War (appointed 1916), the members of the present Cabinet were nominated by the President and confirmed by the Senate on March 5, 1913. By Act of Congress, in the case of vacancy in office of President through the death or removal of both President and Vice-President, the Cabinet officers succeed to the Presidency in the order indicated below.

DEPARTMENT OF STATE

Secretary of State.—Robert Lansing, N. Y.

Charged with negotiations relating to foreign affairs.

Counselor.—Frank Lyon Polk, N. Y. $7,500.

Assistant Secretary.—William Phillips, Mass. $5,000.

Mr. Phillips, formerly Third Assistant Secretary, was confirmed on Jan. 24, 1917, succeeding John E. Osborne, resigned Dec. 9.

Second Assistant Secretary.—Alvey A. Adee, D. C. $4,500.

Third Assistant Secretary.—Breckinridge Long, Mo. $4,500.

Mr. Long, a lawyer of St. Louis, was confirmed on Jan. 24, 1917, succeeding William Phillips, appointed Assistant Secretary.

Director of the Consular Service.—Wilbur J. Carr, N. Y. $4,500.

Solicitor.—Cone Johnson, Tex. $5,000.
Foreign Trade Adviser.—Marion Letcher, Ala. $4,500.
Adviser on Commercial Treaties.—William B. Fleming, Ky. $4,500.
Bureau of Accounts.—Chief, William McNeir, D. C. $2,300.
Bureau of Appointments.—Chief, Miles M. Shand, N. J. $2,100.
Bureau of Citizenship.—Chief, Richard W. Flournoy, Jr., Md. $2,100
Consular Bureau.—Chief, Herbert C. Hengstler, Ohio. $2,250.
Diplomatic Bureau.—Chief, Sydney Y. Smith, D. C. $2,250.
Bureau of Indexes and Archives.—Chief, David A. Salmon. $2,100.
Mr. Salmon was appointed in 1916, succeeding John R. Buck.
Bureau of Rolls and Library.—Chief, John A. Tonner, O. $2,100.
Division of Latin-American Affairs.—Chief, Jordan H. Stabler. $4,500.
Mr. Stabler was appointed in 1915, succeeding J. Butler Wright.
Division of Mexican Affairs.—Chief, Leon J. Canova. $4,500.
Division of Far-Eastern Affairs.—Chief, Edward T. Williams. $4,500.
Division of Near-Eastern Affairs.—Chief, Albert H. Putney. $3,000.
Division of Western European Affairs.—Chief, Frederick A. Sterling.
Mr. Sterling was appointed in 1916, succeeding William W. Smith.
Division of Information.—Chief, John H. James. $3,000.

Treasury Department

Secretary of the Treasury.—William Gibbs McAdoo, N. Y.

Charged with management of the national finances. He prepares plans for improvement of the revenue and support of the public credit; superintends collection of the revenue; grants warrants for all moneys paid from and into the Treasury; controls construction of public buildings; coinage and printing of money; and the administration of the coast guard service, and the public health service; *ex officio* chairman of the Federal Reserve Board and of the Federal Farm Loan Board.

Assistant Secretaries.—Andrew J. Peters, Mass., in charge of customs; ———— ————, in charge of fiscal bureaus; Byron R. Newton, N. Y., in charge of public buildings and miscellaneous. $5,000 each.
Supervising Architect.———— ————, $5,000. Charged with superintending the construction and repair of public buildings.
This office has been vacant since June 30, 1915.
Engraving and Printing.—Chief of Bureau, Joseph E. Ralph, Ill., $6,000. Produces all the securities and similar work of the Government printed from steel plates.
Secret Service.—Chief, William J. Flynn, N. Y. $4,000. Charged with detection of counterfeiting, and similar frauds on the Government.
Comptroller of the Treasury.—Walter W. Warwick, O. $6,000. Construes the laws relating to appropriations and methods of rendering and stating accounts.
Treasurer of the United States.—John Burke, N. D. $8,000. Charged with the receipt and disbursement of all public moneys deposited in the Treasury and sub-treasuries and in national bank depositories.
Comptroller of the Currency.—John Skelton Williams, Va. $5,000. Has supervision of the national banks, their examination and reports; the preparation and issue of national bank circulation; the redemption and destruction of national bank notes. *Ex officio* a member of the Federal Reserve Board; and in this capacity draws a salary of $7,000 in addition to the salary of $5,000 attached to the office proper.
Internal Revenue. — Commissioner, William H. Osborn, N. C. $6,000. General supervision of the collection of all internal revenue taxes, including the income tax, and the enforcement of internal revenue laws.
The Mint.—Director, F. J. H. von Engelken, Fla. $5,000. General supervision of the mints and assay offices.
Mr. von Engelken, a fruit grower, was confirmed on Aug. 17, succeeding Robert W. Wooley, who resigned in July to become director of publicity for the Democratic National Committee.
Farm Loan Board.—Created by the Farm Loan Act of July 17, 1916, for the administration of the Federal rural-credits system established by the Act (see XVII, *Agriculture*). Composed of the Secretary of the Treasury, chairman *ex officio*, and four appointive members (full term, eight years; salary $10,000 per annum). The appointive members of the Board, confirmed Aug. 2, commissioned Aug. 7, with the terms for which they are commissioned, are as follows: George W. Norris, Pa., Farm Loan Commissioner (four years); Herbert Quick, W. Va. (eight years); W. S. A. Smith, Iowa (six years); Charles E. Lobdell, Kan. (two years). Secretary, W. W. Flannagan.
Public Health Service.—Surgeon-General, Rupert Blue. $6,000. Charged with the framing and enforcement of regulations for the prevention of the introduction and spread of contagious diseases; supervision of the quarantine service of the United States, and of the marine hospitals.
Coast Guard.—Captain Commandant, Ellsworth P. Bertholf. $5,000.

War Department

Secretary of War.—Newton Diehl Baker, Ohio, was confirmed by the Senate on March 7, and took the oath of office on March 9, succeeding Lindley Miller Garrison, resigned (see I,

State	1908					1912							1916					
	Taft, Republican		Bryan, Democrat		Debs, Socialist	Wilson, Democrat		Roosevelt, Progressive		Taft, Republican		Debs Socialist	Wilson, Democrat		Hughes, Republican		Benson, Socialist	Progressive
	Electoral	Popular	Electoral	Popular	Popular	Electoral	Popular	Electoral	Popular	Electoral	Popular	Popular	Electoral	Popular	Electoral	Popular	Popular	Popular
Alabama		25,308	11	74,374	1,399	12	82,438		22,680		9,732	3,029	12	99,409		28,809	1,925	
Arizona						3	10,324		6,949		3,021	3,163	3	33,170		20,524	3,174	
Arkansas		56,760	9	87,015	5,842	9	68,838		21,673		24,467	8,153	9	112,186		47,148	6,999	
California	10	214,398		127,492	28,659	2	283,436	11	283,610		3,914	79,201	13	466,289		462,516	42,898	
Colorado		123,700	5	126,644	7,974	6	114,232		72,306		58,386	16,418	6	177,290		101,465	9,963	306
Conn	7	112,915		68,255	5,113	7	74,561		34,129		68,324	10,056		99,786	7	106,514	5,179	
Delaware	3	25,014		22,071	239	3	22,631		8,886		15,997	556		24,753	3	26,011	480	
Florida		10,654	5	31,104	3,747	6	36,417		4,535		4,279	4,806	6	55,984		14,611	5,353	
Georgia		41,692	13	72,413	584	14	93,076		21,980		5,191	1,026	14	125,790		11,194	966	20,636
Idaho	3	52,621		36,162	6,400	4	33,921		25,527		32,810	11,960	4	70,054		55,368	8,066	
Illinois	27	629,929		450,795	34,691	29	405,048		386,478		253,593	81,278		950,229	29	1,152,549	61,394	
Indiana	15	348,993		338,262	13,476	15	281,890		162,007		151,267	36,931		334,063	15	341,005	21,855	3,898
Iowa	13	275,210		200,771	8,287	13	185,325		161,819		119,805	16,967		221,699	13	280,449	10,976	
Kansas	10	197,216		161,209	12,420	10	143,663		120,210		74,845	26,779	10	314,588		277,658	24,685	
Kentucky		235,711	13	244,092	4,060	13	219,584		102,766		115,512	11,647	13	269,990		241,854	4,734	129
Louisiana		8,958	9	63,568	2,538	10	60,971		9,323		3,834	5,249	10	79,875		6,466	292	6,349
Maine	6	66,987		35,403	1,758	6	51,113		48,495		26,545	2,541		64,118	6	69,506	2,186	
Maryland	2	116,513	6	115,908	2,323	8	112,674		57,789		54,956	3,996	8	138,359		117,347	2,674	
Mass	16	265,966		155,543	10,781	18	173,408		142,228		155,948	12,616		247,885	18	268,784	11,058	
Michigan	14	335,580		175,771	11,586		150,751	15	214,584		152,244	23,211		286,775	15	339,097	16,120	
Minnesota	11	195,843		109,401	14,527		106,426	12	125,856		64,334	27,505		179,152	12	179,544	20,117	290
Mississippi		4,363	10	60,287	978	10	57,227		3,645		1,595	2,061	10	80,422		4,253	1,484	520
Missouri	18	347,203		346,574	15,431	18	330,746		124,371		207,821	28,466	18	398,032		369,339	14,612	
Montana	3	32,333		29,326	5,855	4	27,941		22,456		18,512	10,885	4	101,063		66,750	9,564	302
Nebraska		126,997	8	131,099	3,524	8	109,008		72,614		54,029	10,174	8	158,827		117,771	7,141	
Nevada		10,775	3	11,212	2,103	3	7,986		5,620		3,196	3,313	3	17,776		12,127	3,065	
New Hamp	4	53,149		33,655	1,299	4	34,724		17,794		32,927	1,980	4	43,780		43,724	1,319	
New Jersey	12	265,326		182,567	10,253	14	170,282		145,409		88,834	15,900		211,018	14	268,982	10,405	
New Mex						3	22,139		8,347		17,900	2,859	3	33,693		31,097	1,999	
New York	39	870,070		667,468	38,451	45	655,475		390,021		455,428	63,381		759,426	45	869,066	45,944	10,172
No. Car		114,937	12	136,995	378	12	144,507		69,667		29,139	117	12	168,383		120,890	490	
No. Dak	4	57,680		32,885	2,421	5	29,555		25,726		23,090	6,966	5	55,206		53,471	5,716	
Ohio	23	572,312		502,721	33,795	24	424,834		229,807		278,168	90,144	24	604,161		514,753	38,092	
Oklahoma		110,474	7	122,363	21,734	10	119,156		[1]		90,786	41,674	10	148,113		97,233	45,527	234
Oregon	4	62,530		38,049	7,339	5	47,064		37,600		34,673	13,343		120,087	5	126,813	9,711	
Penn	34	745,779		448,778	33,913		395,619	38	447,426		273,305	80,915		521,784	38	703,734	42,637	
R. Island	4	43,942		24,706	1,365	5	30,412		16,878		27,703	2,049		40,394	5	44,858	1,914	
So. Car		3,965	9	62,290	100	9	48,357		1,293		536	164	9	61,845		1,550	135	
So. Dak	4	67,536		40,266	2,846		48,942	5	58,811		[2]	4,662		59,191	5	64,217	3,760	
Tennessee		118,324	12	135,608	1,870	12	130,335		53,725		59,444	3,492	12	153,344		116,114	2,542	
Texas		65,666	18	217,302	7,870	20	219,489		28,530		26,745	24,896	20	286,415		64,949	18,952	
Utah	3	61,028		42,601	4,895		36,579		24,174	4	42,100	9,023	4	84,145		54,137	4,460	
Vermont	4	39,552		11,496			15,354		22,132	4	23,332	928		22,708	4	40,250	798	

VOTE FOR PRESIDENT, 1908, 1912, AND 1916—*Continued*

State	1908						1912								1916							
	Taft, Republican		Bryan, Democrat		Debs, Socialist		Wilson, Democrat		Roosevelt, Progressive		Taft, Republican		Debs, Socialist		Wilson, Democrat		Hughes, Republican		Benson, Socialist		Progressive
	Electoral	Popular	Electoral	Popular	Popular		Electoral	Popular	Electoral	Popular	Electoral	Popular	Popular		Electoral	Popular	Electoral	Popular	Popular		Popular
Virginia	....	52,573	12	82,946	255		12	90,332	....	21,777	....	23,288	820		12	102,824	....	49,356	1,060		.....
Wash	5	106,062	....	58,691	14,177		....	[1]86,840	7	113,698	....	70,445	40,134		7	152,995	....	166,382	22,545		.....
West Va	7	137,869	....	111,418	3,679		8	113,046	....	78,977	....	56,667	15,336		1	140,403	7	143,124	6,150		.....
Wisconsin	13	247,747	....	166,632	28,170		13	164,228	....	62,460	....	130,695	33,481		....	193,042	13	221,323	27,846		.....
Wyoming	3	20,846	....	14,918	1,715		3	15,310	....	9,232	....	14,560	2,760		3	28,316	....	21,698	1,453		.....
Total	321	7,679,006	162	6,409,106	420,820		435	6,286,214	88	4,126,020	8	3,483,922	897,011		277	9,128,837	254	8,536,380	590,415		42,836
Plurality	159	1,269,900	....	.....	.....		347	2,160,194	....	.....	....	.....	.....		....	592,457	....	.....	.....		.....

NOTE.—In 1908 there were cast for Chafin (Prohibitionist), 252,683 votes; for Hisgen (Independence League), 83,562; for Watson (Populist), 28,131; for Gillhaus (Socialist-Labor), 13,825. In 1912 there were cast for Chafin (Prohibitionist), 208,923 votes; for Reimer (Socialist-Labor), 29,079. In 1916 there were cast for Hanly (Prohibitionist) 221,196 votes; for Reimer (Socialist-Labor) 13,922. The total vote in 1908 was 14,887,133; in 1912, 15,031,169; in 1916, 18,533,586; these figures do not include blank or void ballots or scattering votes for names not appearing on any electoral ticket.

[1] Roosevelt electors not on ballot. [2] Taft electors not on ballot.

The Administration). Gen. Hugh L. Scott, Chief of Staff, served as Secretary of War *ad interim* from Feb. 10 to March 9.

Newton Diehl Baker was born in Martinsburg, W. Va., Dec. 3, 1871. He was graduated from Johns Hopkins University with the degree of B. A. in 1892, and from Washington and Lee University with the degree of LL. B. in 1894. He was private secretary to Postmaster-General Wilson from 1896 to 1897, and in the latter year engaged in the practice of law in Martinsburg. In 1902 Mr. Baker was appointed assistant city solicitor of Cleveland, O., and a year later, director of law. He was elected city solicitor from 1903 to 1912, and mayor for the terms 1912-14 and 1914-16. For several years Mr. Baker was a member of the Ohio state Democratic Committee.

Charged with supervision of national defense and expenditures for military purposes.

Assistant Secretary of War.—William M. Ingraham, Me. $5,000.

Mr. Ingraham was confirmed on April 20, succeeding Henry S. Breckinridge, resigned (see I, *The Administration*).

The General Staff.—Chief, Major-Gen. Hugh L. Scott. $8,000. Charged with preparation of plans for the national defense, and the promotion of the efficiency of the Army.

The chiefs of the military bureaus are as follows:

Adjutant-General.—Brig.-Gen. Henry P. McCain. $6,000.

Inspector-General.—Brig.-Gen. E. A. Garlington. $6,000.

Brig.-Gen. John L. Chamberlain was confirmed on Jan. 15, 1917, to succeed General Garlington on his retirement on Feb. 20, 1917.

Judge-Advocate-General. — Brig.-Gen. E. H. Crowder. $6,000.

Quartermaster-General. — Major-Gen. Henry G. Sharpe. $8,000.

General Sharpe was appointed in September, succeeding Major-Gen. J. B. Aleshire.

Surgeon-General.—Major-Gen. William C. Gorgas. $8,000.

Chief of Coast Artillery.—Major-Gen. Erasmus M. Weaver. $8,000.

This office was created by the Fortifications Appropriation Act of July 6, 1916.

Chief of Engineers.—Brig.-Gen. William M. Black. $6,000.

General Black was confirmed on March 5, succeeding Brig.-Gen. Dan C. Kingman.

Chief of Ordnance.—Brig.-Gen. William Crozier. $6,000.

Chief Signal Officer. — Brig.-Gen. George P. Scriven. $6,000.

Brig.-Gen. George O. Squier was confirmed on Jan. 19, 1917, to succeed General Scriven on his retirement on Feb. 13, 1917.

Chief of Bureau of Insular Affairs.—Brig.-Gen. Frank McIntyre. $6,000.

Chief of Militia Bureau.—Brig.-Gen. Wm. A. Mann. $6,000.

Department of Justice

Attorney General.—Thomas Watt Gregory, Tex.

Represents the United States in all legal matters.

Solicitor-General.—John William Davis, W. Va. $10,000. Charged with the business of the Government in the Supreme Court and in state courts.

Assistant to the Attorney-General.—George Carroll Todd, N. Y. $9,000. Charged with matters arising under the federal anti-trust and interstate commerce laws.

Assistant Attorney-General—One at $8,000 (customs division) and six at $7,500.

Post Office Department

Postmaster-General.—Albert Sidney Burleson, Tex.

Has direction and management of the Post Office.

First Assistant Postmaster-General.—John C. Koons, D. C. $5,000. Charged with postmasters' appointments; salaries and allowance; city delivery service.

Mr. Koons was confirmed on Sept. 1, succeeding Daniel C. Roper, who resigned in July to assist in the Democratic campaign.

Second Assistant Postmaster-General.—Otto Praeger, Tex. $5,000. Charged with railway adjustments, miscellaneous transportation, foreign mails, railway mail service, inspection, equipment.

Third Assistant Postmaster-General.—Alexander M. Dockery, Mo. $5,000. Charged with financial system, stamps, money orders, registered mails, classification of domestic mail matter, redemption, postal savings.

Fourth Assistant Postmaster-General.—James I. Blakslee, Pa. $5,000. Charged with rural mails, supplies, dead letters, post route maps.

Navy Department

Secretary of the Navy.—Josephus Daniels, N. C.

Charged with direction of the Navy and superintendence of construction, equipment, and employment of vessels of war.

Assistant Secretary.—Franklin D. Roosevelt, N. Y. $5,000.

General Board of the Navy.—The General Board is advisory to the Secretary of the Navy, and is composed of the following officers:

Admiral of the Navy, ——— ———, president; W. S. Benson, Chief of Naval Operations; Rear-Adm. A. M. Knight, president Naval War College; Rear-Adm. F. F. Fletcher; Rear-Adm. Charles J. Badger; Major-Gen. George Barnett, U. S. Marine Corps; Capt. James H. Oliver; Capt. A. P. Niblack; Capt. Hugh Rodman; Capt. W. B. Fletcher; Commander H. J. Ziegemeier, secretary.

George Dewey, Admiral of the Navy, died on Jan. 16, 1917.

Office of Naval Operations.—Chief, Adm. William S. Benson. $10,000. Charged with the operations of the fleet and with the preparation and readiness of plans for its use in war.

Bureau of Yards and Docks.—Chief, Rear-Adm. Frederic R. Harris. $8,000. Charged with the construction and maintenance of docks and naval buildings.

Admiral Harris was confirmed on Jan. 17, succeeding Civil Engr. H. R. Stanford.

Bureau of Navigation.—Chief, Rear-Adm. Ralph Earle. $6,000. Charged with the education and supervision of line officers and of enlisted men, marine surveys, and the supervision of the Naval Militia.

Admiral Palmer confirmed on Aug. 16, succeeding Rear-Adm. Victor Blue.

Bureau of Ordnance.—Chief, Rear-Adm. Ralph Earle. $8,000. Charged with supervision of the Torpedo Station, magazines on shore, and with the manufacture of explosives, arms and equipment.

Admiral Earle was confirmed on Dec. 21, succeeding Rear-Adm. Joseph Strauss.

Bureau of Construction and Repair.—Chief Constructor, David W. Taylor. $8,000. Charged with the design, construction, care, and repair of ships.

Bureau of Steam Engineering.—Engineer-in-Chief, Rear-Adm. Robert S. Griffin, $6,000. Charged with designing, building and repairing machinery for naval ships.

Bureau of Supplies and Accounts.—Paymaster-Gen. Samuel McGowan. $8,000. Charged with the supply of funds for disbursing officers, and the purchase of all naval supplies.

Bureau of Medicine and Surgery.—Surgeon-General, William C. Braisted. $8,000. Control of naval hospitals and hospital ships.

Judge-Advocate-General.—Capt. Wm. C. Watts. $5,000. Charged with supervision of all legal aspects of the Navy personnel. *Solicitor,* Graham Egerton. $4,000.

Captain Watts was confirmed on Jan. 5, 1917, succeeding Capt. Ridley McLean.

Marine Corps.—Commandant, Major-Gen. George Barnett. $8,000.

Department of the Interior

Secretary of the Interior.—Franklin Knight Lane, Cal.

Charged with patents, pensions, public lands and parks, education, Indian affairs, geological surveys, reclamation of arid lands, and mines.

First Assistant Secretary.—Alexander T. Vogelsang, Cal. $5,000.

Mr. Vogelsang was confirmed on Sept. 1, succeeding Andrieus A. Jones, resigned.

General Land Office.—Commissioner, Clay Tallman, Nev. $5,000. Charged with the survey, management and disposition of the public lands.

Patent Office.—Commissioner, Thomas Ewing, N. Y. $5,000. Administration of the patent laws, and supervision of the registration of trade-marks.

Pension Office.—Commissioner, Gaylord M. Saltzgaber, Ohio. $5,000. Supervision of adjudication of claims arising under laws granting Army or Navy service pensions.

Office of Indian Affairs.—Commissioner, Cato Sells, Tex. $5,000. Has charge of the Indian tribes of the United States (exclusive of Alaska).

Bureau of Education.—Commissioner, Philander P. Claxton, Tenn. $5,000. Collects statistics and general information regarding education; has charge of the schools for native Alaskan children; and administers the endowment fund for colleges of agriculture and mechanic arts.

Geological Survey.—Director, George Otis Smith, Me. $6,000. Charged with classification of the public lands and examination of the geologic structure, mineral resources, and the mineral products of the national domain.

Reclamation Service.—Director and Chief Engineer, Arthur P. Davis, $7,500. Charged with the survey, construction, and operation of the reclamation and irrigation works in arid states, authorized by the act of June 17, 1902.

Bureau of Mines.—Director, Vannoy H. Manning, Miss. $6,000. To promote the mining industry of the United States, foster the safety of miners, and give attention to the treatment of ores and the use of explosives.

National Park Service.—Superintendent, ——— ———, $4,500. Charged with the administration of the national parks and national monuments.

This Service was created by an Act of Aug. 25, 1916.

Department of Agriculture

Secretary of Agriculture.—David Franklin Houston, Mo.

Exercises supervision over agricultural industry, experiment stations, quarantine stations for imported cattle, inspection of foods and drugs, national forest reserves, and interstate game laws.

Assistant Secretary.—Carl Vrooman, Ill. $5,000.

Weather Bureau.—Chief, Charles F. Marvin, D. C. $5,000. Charged with forecasting of weather for the benefit of agriculture, commerce and navigation.

Bureau of Animal Industry.—Chief A. D. Melvin, Ill. $5,000. Conducts inspection of animals and meat food products; investigates communicable diseases and their prevention, and the breeding and feeding of animals.

Bureau of Plant Industry.—Chief, William A. Taylor, Mich. $5,000. Charged with the improvement of crops by breeding and selection, and the introduction of new plants and seeds to different parts of the United States.

Forest Service.—Chief, Henry S. Graves, Conn. $5,000. Charged with the administration of the national forests, the investigation of forest problems and encouragement of protecting growing timber.

Bureau of Chemistry.—Chief, Carl L. Alsberg, Mass. $5,000. Charged with the analysis of agricultural products and fertilizers, and the investigation of the composition and adulteration of foods and drugs.

Bureau of Soils.—Chief, Milton Whitney, Md. $4,000. Charged with investigating soils in their relations to climate and organic life.

Bureau of Entomology.—Chief, L. O. Howard, N. Y. $4,500. Charged with dissemination of information regarding injurious insects affecting forests, crops and fruits, and means of their elimination.

Bureau of Biological Survey.—Chief, E. W. Nelson, Ariz. $3,500. Investigates the economic relations of animal life. Charged with enforcing the bird and game laws.

Bureau of Crop Estimates.—Chief, Leon M. Estabrook, Tex. $4,000. Collects and collates agricultural statistics and issues crop reports and forecasts. This bureau was called the Bureau of Statistics until 1914.

States Relations Service.—Director, A. C. True, Conn. $4,500. Charged with the supervision and promotion of agricultural education and the maintenance of agricultural experiment stations.

Office of Public Roads and Rural Engineering.—Director, Logan W. Page, Mass. $4,500. Charged with investigating road making, road maintenance and road materials, the conduct of irrigation and drainage investigations, and the study of other rural engineering problems.

Office of Markets and Rural Organization.—Chief, Charles J. Brand, Ill. $4,500. Charged with the conduct of investigations of rural economics and cooperative organization.

Office of Farm Management.—Chief, William J. Spillman, Wash. $4,000. Charged with the study and improvement of farm practice.

Department of Commerce

Secretary of Commerce.—William Cox Redfield, N. Y.

Charged with promoting commerce, mining, manufacturing, shipping, fisheries, and transportation.

Assistant Secretary.—Edwin F. Sweet, Mich. $5,000.

Mr. Sweet resigned on Sept. 30 to run for governor of Michigan on the Democratic ticket and was defeated. He was reappointed (recess) on Nov. 11 and confirmed on Dec. 20.

Bureau of Foreign and Domestic Commerce.—Chief, Edward Ewing Pratt, N. Y. $6,000. Charged with the collection and publication of statistics of foreign and domestic commerce, the development of manufactures and markets

therefor, by the publication of information, and the investigation of matters affecting the commercial interest of the United States.

Bureau of Lighthouses.—Commissioner, George R. Putnam, Ia. $5,000. Charged with the administrative duties relating to lighthouses and protective signals.

Steamboat Inspection Service.—Supervising Inspector-General, George Uhler, Penn. $4,000. Charged with the inspection of vessels, the licensing of officers, and the administration of laws relating to steam vessels and their officers.

The Census Office.—Director, Samuel L. Rogers, N. C. $7,000 during decennial census period, $6,000 regular salary. The duty of the Census Office is to take, compile and publish the decennial census of the United States; the quinquennial census of agriculture and manufactures; the deaths in registration areas; the statistics of cotton ginned, and of cotton consumed; the annual statistics of cities; and to make such other statistical investigations as Congress may order.

Coast and Geodetic Survey.—Superintendent, E. Lester Jones, Va. $6,000. Charged with survey of coasts under the jurisdiction of the United States, and publication of charts covering these coasts.

Bureau of Fisheries.—Commissioner, Hugh M. Smith, D. C. $6,000. Charged with the propagation of useful food fishes, investigation of deep sea fishing grounds, and care of the Alaska salmon fisheries and the Pribilof Islands seals.

Bureau of Navigation.—Commissioner, Eugene T. Chamberlain, N. Y. $4,000. Charged with superintendence of the commercial marine, issue of licenses, and collection of tonnage taxes.

Bureau of Standards.—Director, Samuel W. Stratton, Ill. $6,000. Charged with comparing and testing standards used in scientific investigations, commerce and educational institutions, with standards adopted or recognized by the Government.

Department of Labor

Secretary of Labor.—William Bauchop Wilson, Pa.

Charged with the duty of fostering, promoting and developing the welfare of the wage earners of the United States.

Assistant Secretary.—Louis F. Post. $5,000.

Bureau of Immigration.—Commissioner-General, Anthony Caminetti, Cal. $5,000. Charged with administration of immigration laws.

Bureau of Naturalization.—Commissioner, Richard K. Campbell. $5,000. Charged with administration of the naturalization laws.

Bureau of Labor Statistics.—Commissioner, Royal Meeker, N. J. $5,000. Charged with the duty of acquiring and diffusing information concerning labor in its relations to capital and means of promoting prosperity among the laboring classes.

Children's Bureau.—Chief, Julia C. Lathrop, Ill. $5,000. Charged with the investigation of all matters pertaining to the welfare of children and child life.

Independent Bureaus and Institutions

Interstate Commerce Commission.—Seven members, each receiving an annual salary of $10,000; appointed for terms of seven years, one retiring each year. Balthasar H. Meyer, Wis., chairman; Judson C. Clements, Ga.; Edgar E. Clark, Iowa; James S. Harlan, Ill.; Charles C. McChord, Ky.; Henry C. Hall, Col.; Winthrop M. Daniels, N. J. Secretary, George B. McGinty, salary, $5,000.

Mr. Daniels, whose term expired on Dec. 31, 1916, was renominated for a full term of seven years on Dec. 15 and confirmed on Jan. 10, 1917. Mr. Meyer succeeded Mr. McChord as chairman on March 16.

Federal Reserve Board.—Created by the Federal Reserve Act of Dec. 23, 1913, for the supervision of the Federal reserve system. Composed of five appointive members (full term, 10 years; salary, $10,000 per annum) and the Secretary of the Treasury and the Comptroller of the Currency *ex officio*. The appointive members of the board, with the dates on which their terms expire, are as follows: Wm. P. G. Harding, Ala., governor (1922); Paul M. Warburg, N. Y., vice-governor (1918); Frederic A. Delano, Ill. (1920); Adolph C. Miller, Cal. (1924); Charles S. Hamlin, Mass. (1926). Secretary, H. Parker Willis, salary, $5,000.

Mr. Hamlin, whose term expired in 1916, was renominated and confirmed on Aug. 3 for a full term of ten years. On Aug. 10 Mr. Harding was designated governor, succeeding Mr. Hamlin, and Mr. Warburg vice-governor, succeeding Mr. Delano.

Federal Trade Commission.—Created by the Federal Trade Commission Act of Sept. 26, 1914. Endowed by that Act and by the Clayton Anti-trust Act of Oct. 15, 1914, with powers of investigation and publicity over corporations and certain *quasi* judicial functions in the enforcement of anti-trust laws. Composed of five appointive members (full term, seven years), at salaries of $10,000 per annum. The members of the Board, with the dates on which their terms expire, are as follows: Edward N. Hurley, Ill., chairman (1921); Wm. J. Harris, Ga., vice-chairman (1920); Joseph E. Davies, Wis. (1922); Will H. Parry, Wash. (1919); ——— ——— (1918). The fifth membership has never been filled except by recess appointment, the Senate having twice rejected the nomination of George Rublee, N. H. (see I, *The Administration*). Secretary, Leonidas L. Bracken, salary, $5,000.

United States Shipping Board.—Created by the Shipping Act of Sept. 7, 1916 (see XX, *The Merchant Marine*). Charged with the administration

of the Government fleet of merchant vessels and with the regulation of marine carriers. Composed of five appointive members (full term, six years) at salaries of $7,500 per annum. On Jan. 2, 1917, President Wilson nominated the following as members of the Board for the terms indicated: William Denman, San Francisco (six years); Bernard N. Baker, Baltimore (five years); John A. Donald, New York (four years); John B. White, Kansas City (three years); Theodore Brent, New Orleans (two years). All but Mr. Donald were confirmed on Jan. 19, 1917, and Mr. Donald on Jan. 23, 1917.

United States Employees' Compensation Commission.—Created by the Employees' Compensation Act of Sept. 7, 1916, for the administration of the system of compensation for Federal employees established by the Act (see XVI, *Labor Legislation*). Composed of three appointive members (full term, six years) at salaries of $4,000 per annum. On Jan. 5, 1917, President Wilson nominated the following as members of the Commission for the terms indicated: Dr. Riley McMillan Little, Swarthmore, Pa. (six years); Mrs. Frances C. Axtell, Bellingham, Wash. (four years); John K. Keegan, Indianapolis (two years).

United States Board of Mediation and Conciliation.—Created by an Act of July 15, 1913, for the purpose of settling by mediation, conciliation and arbitration industrial disputes at the request of parties thereto. Composed of a commissioner (term, seven years; salary, $7,500), an assistant commissioner (salary, $5,000) and not more than two other members. The present members of the Board are: Wm. L. Chambers, commissioner; G. W. W. Hanger, assistant commissioner; Martin A. Knapp, chairman.

Civil Service Commission.—Commissioners, John A. McIlhenny, La., president, $4,500; Charles M. Galloway, S. C., $4,000; Hermon W. Craven, Wash., $4,000. Charged with the conduct of competitive examinations of applicants for the classified civil service.

Government Printing Office.—Public Printer, Cornelius Ford, N. J. $5,500. Charged with the printing, press work, and binding of all Government publications of every description.

The Library of Congress.—Librarian, Herbert Putnam, Mass. $6,000. Primarily a reference library, composed of numerous collections, presented and bought. It is the third largest collection in the world. Under the jurisdiction of Congress.

Commission of Fine Arts.—Established 1910, to pass upon sites and plans for future buildings, monuments, etc., in the District of Columbia. No compensation, but actual expenses allowed. Chairman, Charles Moore, Mich.; vice-chairman, Frederick Law Olmstead, Mass., landscape architect; Thomas Hastings, N. Y., architect; Herbert Adams, N. Y.; J. Alden Weir, N. Y., painter; Charles A. Platt, N. Y., architect; William M. Kendall, N. Y., architect. Secretary, Col. Wm. W. Harts.

Messrs. Weir, Platt and Kendall were appointed in 1916, succeeding Cass Gilbert, Edwin H. Blashfield and Pierce Anderson.

Smithsonian Institution.—Secretary, Charles D. Walcott. $7,500. Established 1846, under the terms of James Smithson's will, for the "increase and diffusion of knowledge among men." The former is accomplished by promoting original scientific research, and the latter by publication and lectures. Managed by a Board of Regents. It cooperates with the Government and national scientific bodies.

Under the direction of the Smithsonian Institution are the National Museum, charged with preserving and utilizing objects of art and ethnological, geological and mineralogical collections belonging to the United States; and the Bureau of American Ethnology.

Pan-American Union. — Director-General, John Barrett, Ore. $5,000. Established for the purpose of developing closer relations of commerce and friendship between the twenty-one republics of the Western Hemisphere.

THE SIXTY-FOURTH CONGRESS

The Senate.—A complete list of the members of the Senate in the Sixty-fourth Congress at the end of 1915 was given in the YEAR BOOK for 1915 (p. 188). The following changes occurred during 1916: Senator Ben. F. Shively (Dem.) of Indiana died March 14; he was succeeded temporarily by Thomas Taggart (Dem.), sworn in on March 27, and on Nov. 7 James E. Watson (Rep.) was elected for the balance of the term, expiring in 1921. Senator Edwin C. Burleigh (Rep.) of Maine died June 16; the seat was vacant during the remainder of the first session; on Sept. 11 Bert M. Fernald (Rep.) was elected for the balance of the term, expiring in 1919. Senator James P. Clarke (Dem.) of Arkansas, president *pro tempore* of the Senate, died Oct. 1; on Nov. 7 Wm. F. Kirby (Dem.) was elected for the balance of the term, expiring in 1921.

A complete list of the chairmen of the Senate committees in the Sixty-fourth Congress was given in the YEAR BOOK for 1915 (p. 189).

House of Representatives.—A complete list of the members of the House of Representatives in the Sixty-fourth Congress at the end of 1915 was given in the YEAR BOOK for 1915 (p. 190). The following changes occurred during 1916: The vacancy of the rep-

resentation of the Fifth District of Mississippi was filled by the election of Wm. W. Venable (Dem.), sworn in on Jan. 17. W. G. Brown (Dem.) of West Virginia died March 9; he was succeeded by George M. Bowers (Rep.), sworn in on May 18. H. H. Moss (Rep.) of West Virginia died July 15; the seat was vacant during the remainder of the first session; on Nov. 7 H. C. Woodyard (Rep.) was elected for the unexpired term. W. D. Stephens (Prog. Rep.) of California resigned on July 22 to become lieutenant-governor of California; on Nov. 7 H. S. Benedict (Rep.) was elected for the unexpired term. James Hay (Dem.) of Virginia resigned on Sept. 30 to become a judge of the Court of Claims; on Nov. 7 T. W. Harrison (Dem.) was elected for the unexpired term. S. J. Tribble (Dem.) of Georgia died Dec. 8; he was succeeded by Tinsley W. Rucker (Dem.), sworn in on Jan. 15, 1917.

A complete list of the chairmen of the House committees in the Sixty-fourth Congress was given in the YEAR BOOK for 1915 (p. 192).

First Session.—The first session of the Sixty-fourth Congress opened on Dec. 7, 1915, and ended on Sept. 8, a total length of 278 days. The total number of bills and resolutions introduced during the session was 26,029, of which 7,020 were Senate bills and 17,798 House bills. The principal bills of public interest enacted during the session were the following, the dates being those of the President's approval:

S. 19. Relating to bills of lading in interstate and foreign commerce. Public, No. 239. Aug. 29.

S. 381. To declare the purposes of the people of the United States as to the future political status of the people of the Philippine Islands, and to provide a more autonomous government for those islands. Public, No. 240. Aug. 29.

S. 683. Prohibiting the use of the name of any member of either House of Congress or of any officer of the Government by any person, firm or corporation practicing before any department or office of the Government. Public, No. 57. April 27.

S. 1351. Providing for the discovery, development, and protection of streams, springs and water holes in the desert and arid public lands of the United States, for rendering the same more readily accessible, and for the establishment of and maintenance of signboards and monuments locating the same. Public, No. 215. Aug. 21.

S. 2986. To provide capital for agricultural development, to create a standard form of investment based upon farm mortgage, to equalize rates of interest upon farm loans, to furnish a market for United States bonds, to provide for the investment of postal savings deposits, to create Government depositaries and financial agents for the United States, and for other purposes. Public, No. 158. July 17.

S. 3769. To amend section 3 of an act entitled "An act to promote the safety of employees and travelers upon railroads by limiting the hours of service of employees thereon," approved March 4, 1907. Public, No. 681. May 4.

S. 4432. To amend section 8 of an act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved Oct. 15, 1914. Public, No. 75. May 15.

S. 4876. To provide for an increase in the number of cadets at the United States Military Academy. Public, No. 69. May 4.

S. 5425. To standardize lime barrels. Public, No. 228. Aug. 23.

H. R. 228. To amend the United States homestead law in its application to Alaska, and for other purposes. Public, No. 146. July 8.

H. R. 348. To establish the Lassen Volcanic National Park in the Sierra Nevada Mountains in the state of California, and for other purposes. Public, No. 184. Aug. 9.

H. R. 562. To amend the act approved June 25, 1910, authorizing the postal savings system, and for other purposes. Public, No. 81. May 18.

H. R. 4761. To establish in the War Department and in the Navy Department, respectively, a roll designated as "the Army and Navy medal of honor roll," and for other purposes. Public, No. 56. April 27.

H. R. 4767. Authorizing the Director of the Census to collect and publish statistics of cotton seed and cottonseed products, and for other purposes. Public, No. 177. Aug. 7.

H. R. 7617. To provide that the United States shall aid the states in the construction of rural post roads, and for other purposes. Public, No. 156. July 11.

H. R. 8234. To prevent interstate commerce in the products of child labor, and for other purposes. Public, No. 249. Sept. 1.

H. R. 9224. Providing for an increase in number of midshipmen in the United States Naval Academy. Public, No. 18. Feb. 15.

H. R. 9525. To establish a national park in the territory of Hawaii. Public, No. 171. Aug. 1.

H. R. 10484. Making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1917, and for other purposes [including provision for railway mail pay]. Public, No. 169. July 28.

H. R. 11471. To amend paragraphs 177 and 178 of an act entitled "An act to reduce tariff duties and to provide revenue for the Government and for other purposes," approved Oct. 3, 1913,

relating to the duty on sugar, molasses and other articles. Public, No. 61. April 27.

H. R. 11707. An act to amend an act entitled "An act to increase the pensions of widows, minor children, and so forth, of deceased soldiers and sailors of the late Civil War, the War with Mexico, the various Indian wars, and so forth, and to grant a pension to certain widows of the deceased soldiers and sailors of the late Civil War," approved April 19, 1908, and for other purposes. Public, No. 278. Sept. 8.

H. R. 12365. To promote the reclamation of arid lands. Public, No. 196. Aug. 11.

H. R. 12717. Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1917, and for other purposes [including the Cotton Futures Act, the Grain Standards Act, and the Warehouse Act]. Public, No. 190. Aug. 11.

H. R. 12766. For making further and more effectual provision for the national defense, and for other purposes. Public, No. 85. June 3.

H. R. 12835. To authorize and empower officers and enlisted men of the Navy and Marine Corps to serve under the Government of the Republic of Haiti, and for other purposes. Public, No. 88. June 12.

H. R. 13112. To amend section 14 of the Seamen's Act of March 4, 1915. Public, No. 89. June 12.

H. R. 13391. To amend certain sections of the Act entitled "Federal Reserve Act," approved Dec. 23, 1913. Public, No. 270. Sept. 7.

H. R. 13982. To extend temporarily the time for filing applications and fees and taking action in the United States Patent Office in favor of nations granting reciprocal rights to United States citizens. Public, No. 213. Aug. 17.

H. R. 14864. To alter and amend an act entitled "An act granting lands to aid in the construction of a railroad and telegraph line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July 25, 1866, as amended by the acts of 1868 and 1869, and to alter and amend an act entitled "An act granting lands to aid in the construction of a railroad and telegraph line from Portland to Astoria and McMinnville, in the State of Oregon," approved May 4, 1870, and for other purposes. Public, No. 86. June 9.

H. R. 15158. To amend the Judicial Code; to fix the time when the annual terms of the Supreme Court shall commence; and further to define the jurisdiction of that court. Public, No. 258. Sept. 6.

H. R. 15316. To provide compensation for employees of the United States suffering injuries while in the performance of their duties. Public, No. 267. Sept. 7.

H. R. 15455. To establish a United States Shipping Board for the purpose of encouraging, developing and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States with its territories and possessions and with foreign countries; to regulate carriers by water engaged in the foreign and interstate commerce of the United States, and for other purposes. Public, No. 260. Sept. 7.

H. R. 15522. To establish a National Park Service, and for other purposes. Public, No. 235. Aug. 25.

H. R. 15947. Making appropriations for the naval service for the fiscal year ending June 30, 1917, and for other purposes. Public, No. 251. Aug. 29.

H. R. 15955. Extending certain privileges of canal employees to other officials on the Canal Zone and authorizing the President to make rules and regulations affecting health, sanitation, quarantine, taxation, public roads, self-propelled vehicles, and police powers on the Canal Zone, and for other purposes, including provisions as to certain fees, money orders and interest deposits. Public, No. 226. Aug. 21.

H. R. 16763. To increase the revenue, and for other purposes. Public, No. 271. Sept. 8.

H. R. 17058. To fix standards for Climax baskets for grapes and other fruits and vegetables, and to fix standards for baskets and other containers for small fruits, berries and vegetables, and for other purposes. Public, No. 248. Aug. 31.

H. R. 17498. Making appropriations for the support of the Army for the fiscal year ending June 30, 1917, and for other purposes [including revision of the Articles of War]. Public, No. 242. Aug. 29.

H. R. 17700. To establish an eight-hour day for employees of carriers engaged in interstate commerce, and for other purposes. Public, No. 252. Sept. 3 and 5.

H. J. Res. 59. Extending the provisions of the act entitled "An act to increase the internal revenue and for other purposes," approved Oct. 22, 1914, to Dec. 31, 1916. Public Res., No. 21. Dec. 17, 1915.

H. J. Res. 180. Providing for an increase of the enlisted men in the Army in an emergency. Public Res., No. 11. March 17.

H. J. Res. 242. To authorize the President to draft members of the National Guard and of the Organized Militia of the several states, territories and the District of Columbia and members of the National Guard and Military Reserves into the military service of the United States under certain conditions, and for other purposes. Public Res., No. 23. July 1.

Second Session.—The second session of the Sixty-fourth Congress opened on Dec. 4 and recessed from Dec. 22 to Jan. 2, 1917. No bills of public interest were enacted before the holiday recess.

Appropriations.—The total appropriations of Congress for the five fiscal years 1913-17 are given in the following table (see also XIV, *Public Finance*):

ANNUAL APPROPRIATIONS OF CONGRESS, FISCAL YEARS 1913–17

Appropriated	1st and 2d sess. 62d Cong. 1913	3d sess. 62d Cong. 1914	1st and 2d sess. 63d Cong. 1915	3d sess. 63d Cong. 1916	1st sess. 64th Cong. 1917
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*
To supply deficiencies	8,155,587	27,080,512	24,028,999	11,399,025	57,034,118
Legislative, executive, and judicial expenses	34,245,356	35,172,434	37,630,781	36,904,799	37,925,640
Sundry civil expenses	102,538,934	106,749,532	103,080,275	122,940,750	126,788,485
The army	90,958,712	94,266,145	101,019,212	101,959,195	267,596,530
The naval service	123,151,538	140,718,434	144,868,716	149,661,864	313,298,071
The Indian service	8,920,970	9,486,819	9,771,902	9,325,455	10,967,644
Rivers and harbors	40,559,620	51,118,889	26,989,000	33,982,000	42,080,935
Forts and fortifications	4,036,235	5,218,250	5,627,700	6,060,216	25,747,550
Military Academy	1,064,668	1,099,734	997,899	1,069,813	1,225,043
Postal deficiencies[1]	Indefinite	Indefinite	Indefinite	Indefinite	Indefinite
Pensions	165,146,145	180,300,000	169,150,000	164,100,000	158,065,000
Consular and diplomatic service	3,638,047	3,730,642	4,309,856	4,040,446	5,355,096
Department of Agriculture	16,648,168	17,986,945	19,865,832	22,971,782	24,911,791
District of Columbia	10,675,833	11,383,739	12,171,457	11,859,584	12,824,097
Reclamation fund	.....	.....	.....	.....	.....
Miscellaneous	7,642,359	445,197	14,985,991	2,402,923	95,088,358
Totals by session acts (exclusive of the Postal Act)	617,382,178	684,757,276	674,497,625	678,677,858	1,178,908,962
Estimated permanent annual appropriations (exclusive of Sinking Fund)	72,556,424	66,840,664	70,479,407	60,844,207	62,282,673
	689,938,602	751,597,940	744,977,032	739,522,065	1,241,191,635
For the postal service[2]	269,704,599	285,376,271	313,364,667	313,364,667	322,737,679
For deficiencies in the postal service.[2]	1,056,789	942,854	3,413,219	880,971	3,755,329
Grand totals	960,699,990	1,037,917,065	1,061,754,919	1,053,767,704	1,567,684,644

[1] Grants from the Treasury. [2] Payable from the postal revenues.

THE SIXTY-FIFTH CONGRESS

The Senate.—The terms of 32 Senators expire on March 4, 1917. Their successors were elected on Nov. 7, 1916. The following is a complete list of the members of the Senate in the Sixty-fifth Congress:

THE SENATE

Democrats in Roman, 54; Republicans in *italic*, 42; whole number, 96. Salary, $7,500 per year and mileage of 20 cents per mile each way. Those marked * reëlected in 1916. Terms expire in years indicated.

Alabama		Connecticut		Illinois	
1919.	J. H. Bankhead	1921.	*Frank B. Brandegee*	1919.	J. Hamilton Lewis
1921.	Oscar W. Underwood	1923.	*George P. McLean* *	1921.	*Lawrence Y. Sherman*
Arizona		**Delaware**		**Indiana**	
1921.	Marcus A. Smith	1919.	Willard Saulsbury	1921.	*James E. Watson*
1923.	Henry F. Ashurst *	1923.	J. O. Wolcott	1923.	*Harry S. New*
Arkansas		**Florida**		**Iowa**	
1919.	Jos. T. Robinson	1921.	Duncan U. Fletcher	1919.	*Wm. S. Kenyon*
1921.	Wm. F. Kirby	1923.	Park Trammell	1921.	*A. B. Cummins* *
California		**Georgia**		**Kansas**	
1921.	James D. Phelan	1919.	Thos. W. Hardwick	1919.	Wm. H. Thompson
1923.	*Hiram W. Johnson*	1921.	Hoke Smith	1921.	*Charles Curtis*
Colorado		**Idaho**		**Kentucky**	
1919.	John F. Shafroth	1919.	*Wm. E. Borah*	1919.	Ollie M. James
1921.	Chas. S. Thomas	1921.	*James H. Brady*	1921.	J. C. W. Beckham

LOUISIANA
1919. Jos. E. Ransdell
1921. Robt. F. Broussard

MAINE
1919. *Bert M. Fernald*
1923. *Frederick Hale*

MARYLAND
1921. John W. Smith
1923. *J. I. France*

MASSACHUSETTS
1919. *John W. Weeks*
1923. *Henry Cabot Lodge**

MICHIGAN
1919. *Wm. Alden Smith*
1923. *Chas. E. Townsend* *

MINNESOTA
1919. *Knute Nelson*
1923. *Frank S. Kellogg*

MISSISSIPPI
1919. Jas. K. Vardaman
1923. John S. Williams *

MISSOURI
1921. William J. Stone
1923. James A. Reed *

MONTANA
1919. Thos. J. Walsh
1923. Henry L. Myers *

NEBRASKA
1919. *Geo. W. Norris*
1923. G. M. Hitchcock *

NEVADA
1921. F. G. Newlands
1923. Key Pittman *

NEW HAMPSHIRE
1919. Henry F. Hollis
1921. *Jacob H. Gallinger*

NEW JERSEY
1919. Wm. Hughes
1923. *J. S. Frelinghuysen*

NEW MEXICO
1919. *Albert B. Fall*
1923. A. A. Jones

NEW YORK
1921. *Jas. W. Wadsworth*
1923. *Wm. M. Calder*

NORTH CAROLINA
1919. F. M. Simmons
1921. Lee S. Overman

NORTH DAKOTA
1921. *Asle J. Gronna*
1923. *P. J. McCumber* *

OHIO
1921. *Warren G. Harding*
1923. Atlee Pomerene *

OKLAHOMA
1919. Robert L. Owen
1921. Thomas P. Gore

OREGON
1919. Harry Lane
1921. G. E. Chamberlain

PENNSYLVANIA
1921. *Boies Penrose*
1923. *Philander C. Knox*

RHODE ISLAND
1919. *LeBaron B. Colt*
1923. Peter G. Gerry

SOUTH CAROLINA
1919. B. R. Tillman
1921. Ellison D. Smith

SOUTH DAKOTA
1919. *Thomas Sterling*
1921. Ed. S. Johnson

TENNESSEE
1919. John K. Shields
1923. K. D. McKellar

TEXAS
1919. Morris Sheppard
1923. Chas. A. Culberson *

UTAH
1921. *Reed Smoot*
1923. Wm. H. King

VERMONT
1921. *W. P. Dillingham*
1923. *Carroll S. Page* *

VIRGINIA
1919. Thomas S. Martin
1923. Claude A. Swanson*

WASHINGTON
1921. *Wesley L. Jones*
1923. *Miles Poindexter* *

WEST VIRGINIA
1919. *Nathan Goff*
1923. *Howard Sutherland*

WISCONSIN
1921. Paul O. Husting
1923. *R. M. La Follette* *

WYOMING
1919. *F. E. Warren*
1923. John B. Kendrick

House of Representatives.—The following list of members of the House of Representatives in the Sixty-fifth Congress elected on Nov. 7, though unofficial, is compiled by South Trimble, clerk of the House of Representatives. S. J. Tribble (Dem.), elected from the 8th District of Georgia, died Dec. 8; C. H. Brand (Dem.) was elected on Jan. 11, 1917.

HOUSE OF REPRESENTATIVES

Democrats in Roman, 215; Republicans in *Italic*, 215; Progressives in SMALL CAPS, 2; Independent in CAPS, 1; Socialist in *ITALIC CAPS*, 1; Prohibitionist in Roman with †, 1; whole number 435. Those marked * served in the 64th Congress. Salary, $7,500 per annum and mileage of 20 cents per mile.

ALABAMA
1. O. L. Gray *
2. S. H. Dent *
3. H. B. Steagall *
4. F. L. Blackmon *
5. J. T. Heflin *
6. W. B. Oliver *
7. J. L. Burnett *
8. E. B. Almon *
9. George Huddleston *
AT LARGE—W. B. Bankhead

ARIZONA
AT LARGE—Carl Hayden *

ARKANSAS
1. T. H. Caraway *
2. W. A. Oldfield *
3. J. N. Tillman *
4. O. T. Wingo *
5. H. M. Jacoway *
6. S. M. Taylor *
7. W. S. Goodwin *

CALIFORNIA
1. Clarence F. Lea
2. J. E. Raker *
3. *C. F. Curry* *
4. *Julius Kahn* *
5. *J. I. Nolan* *
6. *J. A. Elston* *
7. D. S. Church *
8. *E. A. Hayes* *
9. C. H. Randall *†
10. *Henry Z. Osborne*
11. William Kettner *

COLORADO
1. B. C. Hilliard *
2. *Chas. B. Timberlake* *
3. Edward Keating *
4. Edward T. Taylor *

CONNECTICUT
1. Augustine Lonergan
2. *R. P. Freeman* *
3. *J. Q. Tilson* *
4. *E. J. Hill* *
5. *J. P. Glyn* *

DELAWARE
AT LARGE—Albert F. Polk

FLORIDA
1. Herbert J. Drane
2. Frank Clark *

3. Walter Kehoe
4. W. J. Sears *

GEORGIA

1. J. W. Overstreet
2. Frank Park *
3. C. R. Crisp *
4. W. C. Adamson *
5. W. S. Howard *
6. Jas. W. Wise *
7. Gordon Lee *
8. C. H. Brand
9. Thomas M. Bell *
10. Carl Vinson *
11. J. R. Walker *
12. W. W. Larsen

IDAHO

AT LARGE—
Burton L. French
A. T. Smith *

ILLINOIS

1. *M. B. Madden* *
2. *J. R. Mann* *
3. *W. W. Wilson* *
4. Charles Martin
5. A. J. Sabath *
6. James McAndrews *
7. *Niels Juul*
8. Thomas Gallagher *
9. *F. A. Britten* *
10. *George E. Foss* *
11. *I. C. Copley* *
12. *C. E. Fuller* *
13. *J. C. McKenzie* *
14. *Wm. J. Graham*
15. *E. J. King* *
16. *Clifford Ireland*
17. *J. A. Sterling* *
18. *J. G. Cannon* *
19. *W. B. McKinley* *
20. H. T. Rainey *
21. *L. E. Wheeler* *
22. *W. A. Rodenberg* *
23. M. D. Foster *
24. *T. S. Williams* *
25. *E. E. Denison* *

AT LARGE—*Wm. E. Mason*
Medill McCormick

INDIANA

1. George K. Denton
2. *Oscar E. Bland*
3. W. E. Cox *
4. Lincoln Dixon *
5. *Everitt Sanders*
6. *D. W. Comstock*
7. *Merrill Moores* *
8. *Albert H. Vestal*
9. *F. S. Purnell*
10. *W. R. Wood* *
11. *Milton Kraus*
12. *L. W. Fairfield*
13. H. A. Barnhart *

IOWA

1. *C. A. Kennedy* *
2. *H. E. Hull* *
3. *B. E. Sweet* *
4. *G. N. Haugen* *
5. *J. W. Good* *
6. *C. W. Ramseyer* *
7. *C. C. Dowell* *
8. *H. M. Towner* *
9. *W. R. Green* *
10. *F. P. Woods* *
11. *George C. Scott*

KANSAS

1. *D. R. Anthony, Jr.* *
2. *Edward C. Little*
3. *P. P. Campbell* *
4. Dudley Doolittle *
5. G. T. Helvering *
6. J. R. Connelly *
7. Jouett Shouse *
8. W. A. Ayres *

KENTUCKY

1. A. W. Barkley *
2. D. H. Kincheloe *
3. R. Y. Thomas, Jr.*
4. Ben Johnson *
5. Swagar Sherley *
6. A. B. Rouse *
7. J. C. Cantrill *
8. Harvey Helm *
9. W. J. Fields *
10. *J. W. Langley* *
11. *Caleb Powers* *

LOUISIANA

1. Albert Estopinal *
2. H. G. Dupré *
3. W. P. MARTIN *
4. J. T. Watkins *
5. Riley Wilson *
6. J. Y. Sanders
7. L. Lazaro *
8. James B. Aswell *

MAINE

1. *Louis Goodall*
2. *Wallace H. White, Jr.*
3. *John A. Peters* *
4. *Ira G. Hersey*

MARYLAND

1. J. D. Price *
2. J. F. C. Talbott *
3. C. P. Coady *
4. J. C. Linthicum *
5. *S. E. Mudd* *
6. *F. N. Zihlman*

MASSACHUSETTS

1. *A. T. Treadway* *
2. *F. H. Gillett* *
3. *C. D. Paige* *
4. *S. E. Winslow* *
5. *J. J. Rogers* *
6. *A. P. Gardner* *
7. M. F. Phelan *
8. *F. W. Dallinger* *
9. ALVAN T. FULLER
10. P. F. Tague *
11. *G. H. Tinkham* *
12. J. A. Gallivan *
13. *W. H. Carter* *
14. Richard Olney, 2d *
15. *W. S. Greene* *
16. *Joseph Walsh* *

MICHIGAN

1. F. E. Doremus *
2. *Mark R. Bacon*
3. *J. M. C. Smith* *
4. *E. L. Hamilton* *
5. *C. E. Mapes* *
6. *P. H. Kelley* *
7. *L. C. Cramton* *
8. *J. W. Fordney* *
9. *J. C. McLaughlin* *
10. *G. A. Currie*
11. *F. D. Scott* *
12. *W. F. James* *
13. *C. A. Nichols* *

MINNESOTA

1. *Sydney Anderson* *
2. *F. F. Ellsworth* *
3. *C. R. Davis* *
4. C. C. Van Dyke *
5. *Ernest Lundeen*
6. *Harold Knutson*
7. *A. J. Volstead* *
8. *C. B. Miller* *
9. *Halvor Steenerson* *
10. THOMAS D. SCHALL *

MISSISSIPPI

1. E. S. Candler *
2. H. D. Stephens *
3. B. G. Humphreys *
4. T. U. Sisson *
5. W. W. Venable *
6. B. P. Harrison *
7. P. E. Quin *
8. J. W. Collier *

MISSOURI

1. Milton A. Romjue
2. W. W. Rucker *
3. J. W. Alexander *
4. C. F. Booher *
5. W. P. Borland *
6. C. C. Dickinson *
7. C. W. Hamlin *
8. D. W. Shackleford *
9. Champ Clark *
10. *J. E. Meeker* *
11. W. L. Igoe *
12. *L. C. Dyer* *
13. W. L. Hensley *
14. J. J. Russell *
15. P. D. Decker *
16. T. L. Rubey *

MONTANA

AT LARGE—J. M. Evans *
Jeanette Rankin

NEBRASKA

1. *C. F. Reavis* *
2. C. O. Lobeck *
3. D. V. Stephens *
4. *C. H. Sloan* *
5. A. C. Shallenberger *
6. *M. P. Kinkaid* *

NEVADA

AT LARGE—*E. E. Roberts* *

NEW HAMPSHIRE

1. *C. A. Sulloway* *
2. *E. H. Wason* *

NEW JERSEY

1. *W. J. Browning* *
2. *Isaac Bacharach* *
3. T. J. Scully *
4. *E. C. Hutchinson* *
5. *J. H. Capstick* *
6. *John R. Ramsey*
7. *D. H. Drukker* *
8. *E. W. Gray* *
9. *R. W. Parker* *
10. *Fred R. Lehlbach* *
11. J. J. Eagan *
12. J. A. Hamill *

NEW MEXICO

AT LARGE—W. B. Walton

NEW YORK

1. *Fred C. Hicks* *
2. C. P. Caldwell *
3. Jos. V. Flynn *

4. H. H. Dale *
5. J. P. Maher *
6. *F. W. Rowe* *
7. J. J. Fitzgerald *
8. D. J. Griffin *
9. *O. W. Swift* *
10. *R. L. Haskell* *
11. D. J. Riordan *
12. *MEYER LONDON* *
13. C. D. Sullivan
14. *F. H. La Guardia*
15. M. F. Conry *
16. Peter J. Dooling *
17. J. F. Carew *
18. *George B. Francis*
19. *W. M. Chandler* *
20. *Isaac Siegel* *
21. Murray Hulbert *
22. Henry Bruckner *
23. Dan. C. Oliver
24. *B. L. Fairchild*
25. *J. W. Husted* *
26. *Edmund Platt* *
27. *C. B. Ward* *
28. *R. B. Sanford* *
29. *J. S. Parker* *
30. George R. Lunn
31. *B. H. Snell* *
32. *L. W. Mott* *
33. *H. P. Snyder* *
34. *G. W. Fairchild* *
35. *W. W. Magee* *
36. *N. J. Gould* *
37. *H. H. Pratt* *
38. *T. B. Dunn* *
39. *A. D. Sanders*
40. *S. W. Dempsey* *
41. C. B. Smith *
42. *Wm. F. Waldow*
43. *C. M. Hamilton* *

NORTH CAROLINA

1. J. H. Small *
2. Claude Kitchin *
3. George E. Hood *
4. E. W. Pou *
5. C. M. Stedman *
6. H. L. Godwin *
7. L. D. Robinson
8. R. L. Doughton *
9. E. Y. Webb *
10. Zebulon Weaver

NORTH DAKOTA

1. *H. T. Helgesen* *
2. *G. M. Young* *
3. *P. D. Norton* *

OHIO

1. *Nicholas Longworth* *
2. *Victor Heintz*
3 Warren Gard *
4. B. F. Welty
5. John S. Snook
6. *C. C. Kearns* *
7. *S. D. Fess* *
8. J. A. Key *
9. I. R. Sherwood *
10. *R. M. Switzer* *
11. H. C. Claypool
12. C. L. Brumbaugh *
13. A. W. Overmyer *
14. E. R. Bathrick
15. George White
16. *R. C. McCulloch* *
17. W. A. Ashbrook *
18. *D. A. Hollingsworth* *
19. *J. G. Cooper* *
20. William Gordon *
21. Robert Crosser *
22. *H. I. Emerson* *

OKLAHOMA

1. *T. A. Chandler*
2. W. W. Hastings *
3. C. D. Carter *
4. T. D. McKeown
5. J. B. Thompson *
6. Scott Ferris *
7. J. V. McClintic *
8. *D. T. Morgan* *

OREGON

1. *W. C. Hawley* *
2. *N. J. Sinnott* *
3. *C. N. McArthur* *

PENNSYLVANIA

1. *W. S. Vare* *
2. *G. S. Graham* *
3. *J. H. Moore* *
4. *G. W. Edmonds* *
5. *P. E. Costello* *
6. *G. P. Darrow* *
7. *T. S. Butler* *
8. *H. W. Watson* *
9. *W. W. Griest* *
10. *J. R. Farr* *
11. *G. W. Templeton*
12. *R. D. Heaton* *
13. A. G. Dewalt *
14. *L. T. McFadden* *
15. *E. R. Kiess* *
16. J. V. Lesher *
17. *B. K. Focht* *
18. *A. S. Kreider* *
19. *John M. Rose*
20. A. R. Brodbeck
21. *C. H. Rowland* *
22. *Edwin E. Robbins*
23. B. F. Sterling
24. *H. W. Temple* *
25. *Henry A. Clark*
26. H. J. Steele *
27. *Nathan L. Strong*
28. *O. D. Bleakley*
29. *S. G. Porter* *
30. M. Clyde Kelly
31. *J. M. Morin* *
32. Guy E. Campbell

AT LARGE—*T. S. Crago* *, *M. M. Garland* *, *Joseph McLaughlin*, *John R. K. Scott* *

RHODE ISLAND

1. G. F. O'Shaunessy *
2. *W. R. Stiness* *
3. *Ambrose Kennedy* *

SOUTH CAROLINA

1. R. S. Whaley *
2. J. F. Byrnes *
3. F. H. Dominick
4. S. J. Nicholls *
5. D. E. Finley *
6. J. W. Ragsdale *
7. A. F. Lever *

SOUTH DAKOTA

1. *C. H. Dillon* *
2. *R. C. Johnson* *
3. H. L. Gandy *

TENNESSEE

1. *S. R. Sells* *
2. *R. W. Austin* *
3. J. A. Moon *
4. Cordell Hull *
5. W. C. Houston *
6. J. W. Byrns *
7. L. P. Padgett *
8. T. W. Sims *
9. F. J. Garrett *
10. Hubert Fisher

TEXAS

1. Eugene Black *
2. Martin Dies *
3. James Young *
4. Sam Rayburn *
5. H. W. Sumners *
6. Rufus Hardy *
7. A. W. Gregg *
8. J. H. Eagle *
9. J. J. Mansfield
10. J. P. Buchanan *
11. Thomas Connally
12. James C. Wilson
13. Marvin Jones
14. J. L. Slayden *
15. J. N. Garner *
16. Thos. L. Blanton

AT LARGE—D. E. Garrett, Jeff. McLemore*

UTAH

1. Milton H. Welling
2. J. H. Mays *

VERMONT

1. *F. L. Greene* *
2. *P. H. Dale* *

VIRGINIA

1. W. A. Jones *
2. E. E. Holland *
3. A. J. Montague *
4. W. A. Watson *
5. E. W. Saunders *
6. Carter Glass *
7. T. W. Harrison
8. C. C. Carlin *
9. *C. B. Slemp* *
10. H. D. Flood *

WASHINGTON

1. *John F. Miller*
2. *L. H. Hadley*
3. *A. Johnson* *
4. *W. L. La Follette* *
5. C. C. Dill *

WEST VIRGINIA

1. M. M. Neely *
2. *George M. Bowers* *
3. *Stuart F. Reed*
4. *H. C. Woodyard*
5. *Edward Cooper* *
6. Adam B. Littlepage *

WISCONSIN

1. *H. A. Cooper* *
2. *Edward Voight*
3. *J. M. Nelson* *
4. *W. J. Cary* *
5. *W. H. Stafford* *
6. *J. H. Davidson*
7. *J. J. Esch* *
8. E. E. *Browne* *
9. David G. Classon
10. *J. A. Frear* *
11. *I. L. Lenroot* *

WYOMING

AT LARGE—*F. W. Mondell* *

THE FEDERAL JUDICIARY

The United States Supreme Court.—Supreme Court justices are appointed for life and receive salaries of $14,500 per year, except the Chief Justice, whose salary is $15,000. The justices of the Supreme Court are:

	Born	App.
Edward D. White, La., Chief Justice	1845	1894
Joseph McKenna, Cal.	1843	1898
Oliver W. Holmes, Mass.	1841	1902
William R. Day, Ohio.	1849	1903
Willis Van Devanter, Wyo.	1859	1910
Mahlon Pitney, N. J.	1858	1912
James C. McReynolds, Tenn.	1862	1914
Louis D. Brandeis	1856	1916
John H. Clarke	1857	1916

Clerk, James D. Maher, D. C.	$6,000
Marshal, Frank Key Green	3,500
Reporter, Ernest Knaebel, Col.	4,500

Associate Justice Joseph Rucker Lamar, appointed in 1910, died in Washington on Jan. 2, 1916. Associate Justice Charles Evans Hughes resigned on June 10 on receiving the Republican nomination for President. Their successors are, respectively, Louis D. Brandeis and John H. Clarke.

Louis Dembitz Brandeis was born in Louisville, Ky., Nov. 13, 1856. He was educated in the public schools of Louisville and in the Annen Real Schule in Dresden, Saxony, where he resided from 1872 to 1875. In the latter year he entered the Harvard Law School, and on graduation in 1878, began the practice of law in St. Louis. In 1879 he removed to Boston. Mr. Brandeis first came into national prominence as counsel for Mr. Glavis in the Ballinger-Pinchot investigation of 1910, and as counsel for shippers in the advance freight rate hearings before the Interstate Commerce Commission in 1911. He has been counsel for the people in several important cases relating to the constitutionality of labor laws and the regulation of public-service corporations. In recent years he has been conspicuous as a leader in the Zionist movement. Mr. Brandeis was nominated as Associate Judge of the Supreme Court on Jan. 28, was confirmed in the face of much opposition on June 1, and was sworn in on June 5. (See also I, *The Administration.*)

John Hessin Clarke was born in Lisbon, Ohio, Sept. 18, 1857. He was graduated from Western Reserve University in 1877, and admitted to the Ohio bar the following year. He practiced law at Lisbon from 1878 to 1880, at Youngstown from 1880 to 1897, and subsequently at Cleveland, acting as general counsel for the New York, Chicago & St. Louis Railway Co. and as attorney for many corporations. In 1903 he was the Democratic nominee for U. S. Senator, but was defeated by Mark A. Hanna. In July, 1914, he was appointed by President Wilson U. S. district judge for the Northern District of Ohio. Judge Clarke was nominated as Associate Justice of the Supreme Court on July 14, was confirmed on July 24, and was sworn in on Aug. 1.

United States Circuit Courts of Appeals.—The act of March 3, 1911 (*A. Y. B.*, 1912, p. 231), provides that there shall be in each judicial circuit a Circuit Court of Appeals, which shall consist of three judges, two of whom shall constitute a quorum; the Chief Justice and the associate justices of the Supreme Court assigned to each circuit, and the several district judges within each circuit, shall be competent to sit as judges of the circuit court of appeals within their respective circuits, in addition to the judges of the circuit courts abolished in 1912. There were 30 circuit judges on Dec. 31, 1916, with two vacancies in the Seventh Circuit. The salary of circuit judges is $7,000.

United States District Courts.—The judicial districts into which the United States is divided were enumerated in the YEAR BOOK for 1913 (p. 175). On Dec. 31, 1916, there were 95 district judges in the United States, exclusive of the non-contiguous territories (salary $6,000). There are four U. S. district judges in Alaska (salary, $7,500), two in Hawaii (salary, $6,000), one in Porto Rico (salary, $5,000), and one in the Canal Zone (salary, $6,000).

Court of Claims.—Claims against the United States are adjudicated by a Court of Claims consisting of five judges appointed for life or during good behavior, the Chief Justice receiving a salary of $6,500 and the associated judges of $6,000. The Court is now constituted as follows:

Chief Justice.—Edward K. Campbell, appointed 1913.
Judges.—Fenton W. Booth, appointed 1897.
Samuel S. Barney, appointed 1906.
George E. Downey, appointed 1915.
James Hay, appointed 1916.

Court of Customs Appeals.—The Court of Customs Appeals, created by the tariff act of 1909, is constituted as follows:

Presiding Judge.—Robert M. Montgomery, Michigan.
Associate Judges.—James F. Smith, California; Orion M. Barber, Vermont; Marion De Vries, California; George E. Martin, Ohio.

THE DIPLOMATIC SERVICE

ACCREDITED BY UNITED STATES — ACCREDITED TO UNITED STATES

AMBASSADORS

Country	Appointed		Commissioned
Argentina	Frederic Jesup Stimson	1914	Rómulo S. Naón 1912
Austria-Hungary	Frederic C. Penfield	1913	Count A. Tarnow von Tarnowski 1916
Brazil	Edwin V. Morgan	1912	Domicio da Gama 1911
Chile	Joseph H. Shea	1916	——— ———
France	William G. Sharp	1914	J. J. Jusserand 1903
Germany[2]	——— ———		——— ———
Great Britain	Walter H. Page	1913	Sir Cecil Arthur Spring-Rice 1913
Italy	Thomas N. Page	1913	Count V. Macchi di Cellere 1914
Japan	George W. Guthrie	1913	Aimaro Sato 1916
Mexico	Henry P. Fletcher	1915	——— ———
Russia	David R. Francis	1916	George Bakhméteff 1911
Spain	Joseph E. Willard	1913	Señor Don Juan Riaño y Gayangos 1910
Turkey	Abram I. Elkus	1916	A. Rustem Bey 1914

MINISTERS PLENIPOTENTIARY

Belgium	Brand Whitlock	1913	E. Havenith 1911
Bolivia	John D. O'Rear	1913	Señor Don Ignacio Calderon 1904
Bulgaria	——— ———		Stephan Panaretoff 1915
China	Paul S. Reinsch	1913	V. K. Wellington Koo 1915
Colombia	Thaddeus A. Thompson[1]	1913	Señor Don Julio Betancourt 1912
Costa Rica	Edward J. Hale	1913	Señor Don Manuel Castro Quesada 1915
Cuba	William E. Gonzales	1913	Dr. Carlos Manuel de Céspedes 1914
Denmark	Maurice Francis Egan	1907	Constantin Brun 1913
Dominican Republic	William W. Russell	1915	Señor Dr. A. Pérez Perdomo 1915
Ecuador	Charles S. Hartman	1913	Señor Don Gonzalo S. Córdova 1913
Greece and Montenegro	Garrett Droppers	1914	——— ———
Guatemala	William H. Leavell	1913	Señor Don Joaquin Mendes 1912
Haiti	Arthur Bailly-Blanchard	1914	Solon Ménos 1914
Honduras	John Ewing	1913	Dr. Alberto Membreño 1912
Netherlands and Luxemburg	Henry Van Dyke	1913	W. L. F. C. Van Rappard 1914
Nicaragua	Benjamin J. Jefferson	1913	Sr. Don Joaquin C. Zavala 1916
Norway	Albert J. Schmedemann	1913	H. H. Bryn 1910
Panama	William J. Price	1913	Sr. Don Eusebius A. Morales 1913
Paraguay	Daniel F. Mooney	1914	Héctor Valázquez 1913
Persia	John L. Caldwell	1914	Mehdi Khan 1914
Peru	Benton McMillan	1913	Manuel de Freyre y Santander 1916
Portugal	Thomas H. Birch	1913	Viscount de Alte 1902
Rumania, Serbia and Bulgaria	Charles J. Volpicka	1913	——— ———
Salvador	Boaz W. Long	1914	Señor Dr. Don Rafael Zaldivar 1915
Siam	——— ———		Phya Prabha Karavongse 1914
Sweden	Ira Nelson Morris	1914	W. A. F. Ekengren 1911
Switzerland	Pleasant A. Stovall	1913	Dr. Paul Ritter 1909
Uruguay	Robert E. Jeffery	1915	Dr. Carlos Maria de Pena 1911
Venezuela	Preston McGoodwin	1913	Señor Don Santos A. Dominici 1914

[1] Resigned. [2] Diplomatic relations severed, Feb. 3, 1917.

THE CONSULAR SERVICE

By Act of Congress of Feb. 5, 1915, it is provided that consuls general and consuls will hereafter be appointed with the advice and consent of the Senate to grades and classes of the Service and not to particular posts. They will receive commissions as officers of specific classes and may be assigned by the President to posts of duty as the interest of the Service may require, and may be transferred by the President from one post to another as he may deem proper.

Consuls general and consuls are graded, classified and compensated as follows:

Consuls General	
Class one,	$12,000
Class two,	8,000
Class three,	6,000
Class four,	5,500
Class five,	4,500

Consuls	
Class one,	$8,000
Class two,	6,000
Class three,	5,000
Class four,	4,500
Class five,	4,000
Class six,	3,500
Class seven,	3,000
Class eight,	2,500
Class nine,	2,000

There are in all 54 consuls general and 235 consuls stationed in the principal cities of the various countries of the world. In addition there are 185 consular agents who are subordinate to the principal consular officers.

CIVIL SERVICE

CLINTON ROGERS WOODRUFF

Federal Civil Service.—The Federal Civil Service Commission reports that on June 30, 1916, there were 480,327 officers and employees in the executive civil service. Of these 296,926 held positions subject to competitive examination under the civil-service rules, an increase of 4,635. Of the 183,401 persons whose positions are not subject to competitive examination under the civil-service rules, 10,975 are presidential appointees, 9,175 being postmasters of the first, second, and third classes; 5,447 are clerks in charge of contract stations; 72,000 are clerks in third- and fourth-class post offices; 8,026 are mail messengers; 11,993 are star-route, steamboat, screen-wagon, and pneumatic-tube contractors; 4,521 are pension examining surgeons; 18,230 are engaged in the Panama Canal work, chiefly as laborers and minor employees; and 28,769 are unclassified laborers not elsewhere enumerated, of whom 6,500 are subject to tests of physical fitness under labor regulations. The remaining 23,440 are excepted from examination under Schedule A, or are subject to non-competitive examination under Schedule B of the civil-service rules, of whom 1,334 are employed in Washington and the others in branches of the field service. Few important positions are excepted from competitive examination under Schedules A and B. Their great variety may be seen by reference to those schedules.

On Oct. 3, 1915, employees engaged in the work of collecting the Federal income tax were automatically included within the classified service. These employees under a provision in the Tariff Act of 1913 were exempted from the provisions of the civil-service law for a period of two years. They number 634.

During the fiscal year there was a decided increase in the number of important positions, requiring a high degree of professional and administrative qualifications, filled through competitive examination, due to the creation of additional technical bureaus and the expansion of the technical activities of the Government in research and experimental work requiring the employment of experts. Some of the most important of these examinations have been held at the voluntary request of the Departments, for positions excepted from examination. According to the National Civil Service Reform Association, there is evidence of a marked diminution in political activity on the part of employees each year.

A number of raids and attempted raids on the civil-service principle were made by Congress during 1916, constituting one of the most unfavorable records of recent years. Early in the year there appeared in the National Defense bill a provision which would make it impossible to appoint anyone to a position in the War Department unless he had had at least six years' service in the Army. Such appointment was to be made upon the recommendation of commissioned officers, and the Civil Service Commission was to have nothing to do with the examinations for such places. A vigorous campaign was made against this provision by the National Civil Service Reform League and it was eliminated from the bill while in conference committee. The committee inserted in the bill, however, a provision for a position in the Judge Advocate General's office, the qualifications of which were described as follows:

> One such vacancy not below the grade of major shall be filled by the appointment of a person from civil life not less than 45 nor more than 50 years of age, who shall have been for ten years a judge of the Supreme Court of the Philippine Islands; shall have served for two years as captain in the Regular or volunteer Army, and shall be proficient in the Spanish language and laws.

This provision was inserted by Mr. Hay (Va.), chairman of the House Committee on Military Affairs, for the benefit of Judge Henry M. Carson of Virginia, who alone possessed the specified qualifications. The Immigration bill contained a provision that the Secretary of Labor in the enforcement of the section which excludes contract laborers from the country

may employ for such purposes and for detail upon additional service under this act when not so engaged without reference to the provisions of the civil service . . . such persons as he may deem advisable, and from time to time fix, raise or decrease their compensation.

Under this provision the Secretary of Labor could assign such persons as might be employed to enforce the contract-labor section to perform duties which ordinarily would be performed by members of the classified civil service. The Act establishing the Shipping Board contains a provision which excepts from competitive examination "a secretary, a clerk to each commissioner, the attorneys, naval architects and special experts and examiners as the Board may from time to time find necessary to employ for the conduct of its work." The Farm Loan Act contains a provision excepting all "attorneys, experts, assistants, clerks, laborers and other employees, and all registrars and appraisers" employed by the Farm Loan Board from the provisions of the civil-service law. After having made this sweeping exemption, the bill went on to provide that "nothing herein shall prevent the President from placing said employees in the classified service." This provision was identical with one contained in the Act creating the Federal Reserve Board (*A. Y. B.*, 1913, p. 181), and this fact was used as an excuse on the floor of the Senate for including the provision in the Farm Loan Act. The National Civil Service Reform League has asked the Farm Loan Board to refer the entire matter of the selection of its employees to the Civil Service Commission. This action was taken by the Federal Reserve Board when considering the selection of its employees. Another measure which made exemptions from the provisions of the civil-service law was the section of the General Revenue Act creating a Tariff Commission, which contains the following provision: "With the exception of the secretary, clerk to each commissioner and such special experts as the Commission may from time to time find necessary for the conduct of the work, all employees of the Commission shall be a part of the classified service."

The Bureau of Efficiency of the Civil Service Commission was, by act of Congress, made an independent bureau under the title of the United States Bureau of Efficiency.

State Civil Service.—In Massachusetts the legislature, on the recommendation of Governor McCall, amended the civil-service law giving the state commission power to establish an efficiency record system in the state service and extending the jurisdiction of the commission slightly. In Colorado an initiated constitutional amendment to establish the merit system was defeated in November. In New Jersey the 1916 legislature has to its credit a number of amendments to the civil-service law strengthening it in minor details. In New York the Senate Committee on Civil Service made a careful and comprehensive analysis of the state service, and drew up standards and specifications of employment in all the state departments. A bill amending the civil-service law in accordance with a report of the Committee, giving the Civil Service Commission power to establish service records in all the departments, passed the Senate but failed of passage in the Assembly.

Municipal Civil Service.—The New York City Commission, having jurisdiction over a force of more than 54,000 employees, drew up and adopted during the year a complete set of physical standards for positions in the city service. By the scientific use of these physical standards the Commission is able to eliminate unfit candidates in a short time and at relatively small cost. The Commission is thoroughly reorganizing its efficiency record system. It proposes at an early date to reclassify the city service with a view to transferring from the exempt to the competitive class many positions for which competition is unquestionably practicable. The bureau of standards of the Board of Estimate and Apportionment has expended a great deal of effort to bring about a constructive reform in the classification, as to duties, of positions in the city service.

The administration of the civil-service law in Chicago has continued to be the subject of serious criticism on the part of the Chicago Civil Service Reform Association. Under the

present administration the Association alleges that the civil-service law has been prostituted to political expediency as never before. It is said that Mayor Wm. H. Thompson's record so far as it pertains to the administration of the Chicago civil-service law, has been the cause of his withdrawal of his candidacy for various political offices in the state and nation, and of his determination not to seek reëlection.

New administrations in Philadelphia and Cleveland promptly took up the question of the reorganization of the civil service, with a view to letting down some of the higher bars. In both cities new civil-service commissions have been appointed and they have endeavored so to change the rules as to enable the mayors and heads of departments to have a freer hand in the matter of appointments. The attack in Cleveland seems to have been the more vigorous and successful. In Philadelphia Mayor Smith has definitely retained a number of the Blankenburg appointees, notably the chiefs of the bureaus of water and highways, two extremely important bureaus, and has so far refrained from expelling a number of others who made excellent records in his predecessor's administration. It was unfortunate that Mayor Blankenburg established a precedent of appointing an entirely new civil-service commission at the beginning of his term instead of filling in the commission with new appointees as the terms of the old members expired. The natural sequence was that the present mayor followed the precedent and appointed his own commission.

A legal decision of interest to all engineers and of special interest to engineers in Boston was filed in the Dorchester district court on June 27, by Judge Joseph R. Churchill. This decision ordered the reinstatement of the division engineer in charge of the sewer and water service, the superintendent of the permit department of the paving division, and the superintendent of the main drainage system, who, of 17 employees of the Public Works Department discharged in January, contested the action of the mayor in announcing that their positions were abolished. A few days after their discharge a hearing was given to these three men by the commissioner of public works, as provided under the civil-service regulations. The commissioner maintained that he had no complaint as to their efficiency, but that the department had been reorganized and the positions held by the three men abolished, so that there was no further occasion for their services.

An extended critical review of municipal civil-service reports by F. W. Coker appeared in the October issue of the *National Municipal Review.*

Organizations.—The ninth annual meeting of the Assembly of Civil Service Commissions was held in Ottawa, Canada, on June 14-16. Committee reports were presented on efficiency records, examination standards and a final report from the committee on standard law. The report of the latter committee resulted in the adoption of the draft of the model law (*A. Y. B.*, 1915, p. 197), but the continuance of the committee was authorized and it was directed that the law include alternative provisions to regulate the appointment of civil-service commissioners. The Assembly also voted to include a statement of fact illustrating the several views on the question of removal of employees. William Foran of Ottawa, Canada, secretary of the Civil Service Commission of Canada, was elected president and John T. Doyle, of the Federal Commission, was reëlected secretary.

The annual meeting of the National Civil Service Reform League was held at New Haven, Conn., on Dec. 5-6. Richard Henry Dana and George T. Keyes were reëlected president and vice-president, respectively.

VI. STATE AND COUNTY GOVERNMENT

JOHN M. MATHEWS

In the following series of tables the more important facts relative to the forty-eight states which at present constitute the American Union are brought together for convenient reference:

1. The first table gives the area and population of the states, together with the dates upon which they severally ratified the Constitution of the United States, or upon which they were admitted to the Union. The population in 1900 and 1910 is given, together with the percentage of increase since 1900, and the rank of the several states in population at the census of 1910.

The population of the continental United States at the thirteenth census taken April 15, 1910, was 91,972,266, an increase of 15,977,691 over the population of June 1, 1900, and an increase of 21 per cent., as compared with an increase of 22.7 per cent. in 1900. The states in which the population increased more than 50 per cent. include Oklahoma, New Mexico, Arizona, Nevada, Washington, Oregon, California, North Dakota, Montana, Wyoming, and Idaho. All these states, it will be noted, are situated in the western half of the United States.

Including Alaska, Hawaii, Porto Rico, and military persons abroad, the population was 93,402,151. If the population of the Philippine Islands (8,265,348, estimated) is added, with estimates for Guam, Samoa and the Canal, the total population of the United States and possessions on April 15, 1910, was 101,748,269. On July 1, 1916, the population of the continental United States, as estimated by the Bureau of the Census, was 102,017,312.

The apportionment of state representatives in Congress (*A. Y. B.*, 1912, p. 159) is based upon the population in the year 1910 as given upon the following page.

2. The second table gives for each state, as reported by the Bureau of the Census for the year 1915, the assessed valuation of property and the total tax levy; the bonded debt and the net debt; and the revenue and non-revenue receipts and the governmental cost and other expenditures. In the YEAR BOOK for 1915 (p. 200) were given similar data relating to the years 1912 and 1913 taken from the decennial census of wealth, debt, and taxation.

3. The third table revises and extends the table on pp. 184-9 of the YEAR BOOK for 1910, which gave the facts in regard to the state constitutions; dates of adoption; methods of ratification of present and former constitutions, and the existing methods of amendment authorized by law in each state.

4. The fourth table gives the state governors; their politics; the length of the governor's term in each state; the date of the beginning and ending of his term; and his salary.

5. The fifth table presents the main features regarding the state legislatures, including the political complexion of the legislatures; number of members of each house; length of the term; frequency of session; the limit upon duration of sessions, if any; and the salaries of members of both branches of the legislature.

6. The sixth table indicates the main facts regarding the state judiciary; the name of the courts and number of judges; how chosen; length of term; and salary.

7. The seventh table indicates the number of counties in each state and the general facts as to the county officers, their titles, which, as a rule, indicate their functions, and whether elected or appointed.

I. THE STATES OF THE UNION

Area, Population, Dates of Ratification and Organization, and Order of Admission to the Union

	Ratification of Constitution	Area, sq. m.	Population, 1900	Population, 1910	Percentage of Increase, 1900–1910	Rank in Population, 1910
New Hampshire	June 21, 1788	9,341	411,588	430,572	4.6	39
Massachusetts	February 6, 1788	8,266	2,805,346	3,366,410	20.0	6
Rhode Island	May 29, 1790	1,248	428,556	542,610	26.6	38
Connecticut	January 9, 1788	4,965	908,420	1,114,756	22.7	31
New York	July 26, 1788	49,204	7,268,894	9,113,614	25.4	1
New Jersey	December 18, 1788	8,224	1,883,669	2,537,167	34.7	11
Pennsylvania	December 12, 1787	45,126	6,302,115	7,665,111	21.6	2
Delaware	December 7, 1787	2,370	184,735	202,322	9.5	46
Maryland	April 28, 1788	12,327	1,188,044	1,294,450	9.0	27
Virginia	June 26, 1788	42,627	1,854,184	2,061,612	11.2	20
North Carolina	November 21, 1789	52,426	1,893,810	2,206,287	16.5	16
South Carolina	May 23, 1788	30,989	1,340,316	1,515,400	13.1	26
Georgia	January 2, 1788	59,265	2,216,331	2,609,121	17.7	10

	Date of Admission	Area, sq. m.	Population, 1900	Population, 1910	Percentage of Increase, 1900–1910	Rank in Population, 1910
Vermont	February 18, 1791	9,564	343,641	355,956	3.6	42
Kentucky	June 1, 1792	40,598	2,147,174	2,289,905	6.6	14
Tennessee	June 1, 1796	42,022	2,020,616	2,184,789	8.1	17
Maine	March 3, 1820	33,040	694,466	742,371	6.9	34
Texas	December 29, 1845	265,896	3,048,710	3,896,543	27.8	5
West Virginia	June 20, 1863	24,170	958,800	1,221,119	27.4	28
Ohio	April 30, 1802	41,040	4,157,545	4,767,121	14.7	4
Louisiana	April 8, 1812	48,506	1,381,625	1,656,388	19.9	24
Indiana	December 11, 1816	36,354	2,516,462	2,700,876	7.3	9
Mississippi	December 10, 1817	46,865	1,551,270	1,797,114	15.8	21
Illinois	December 3, 1818	56,665	4,821,550	5,638,591	16.9	3
Alabama	December 14, 1819	51,998	1,828,697	2,138,093	16.9	18
Missouri	March 2, 1821	69,420	3,106,665	3,293,335	6.0	7
Arkansas	June 15, 1836	53,335	1,311,564	1,574,449	66.2	25
Michigan	January 26, 1836	57,980	2,420,982	2,810,173	16.1	8
Florida	March 3, 1845	58,666	528,542	752,619	42.1	33
Iowa	December 28, 1846	56,147	2,231,853	2,224,771	-0.3	15
Wisconsin	May 29, 1848	56,066	2,069,042	2,333,860	12.7	13
California	September 9, 1850	158,297	1,485,053	2,377,549	60.1	12
Minnesota	May 11, 1858	84,682	1,751,394	2,075,708	18.5	19
Oregon	February 14, 1859	96,699	413,536	672,765	62.7	35
Kansas	January 29, 1861	82,158	1,470,495	1,690,949	15.0	22
Nevada	March 21, 1864	110,690	42,335	81,875	93.4	48
Nebraska	February 9, 1867	77,520	1,066,300	1,192,214	11.8	29
Colorado	March 3, 1875	103,948	539,700	799,024	48.0	32
North Dakota	February 22, 1889	70,837	319,146	577,056	80.8	37
South Dakota	February 22, 1889	77,615	401,570	583,888	45.4	36
Montana	February 22, 1889	146,997	243,329	376,053	54.5	40
Washington	February 22, 1889	69,127	518,103	1,141,990	120.4	30
Idaho	July 3, 1890	83,888	161,772	325,594	101.3	44
Wyoming	July 10, 1890	97,914	92,531	145,965	57.7	47
Utah	July 16, 1894	84,990	276,749	373,351	34.9	41
Oklahoma	November 16, 1907	70,057	790,391	1,657,155	109.7	23
New Mexico	January 6, 1912	122,634	195,310	327,301	67.6	43
Arizona	February 14, 1912	113,956	122,931	204,354	66.2	45

Area.—The total area of continental United States is 3,026,789 sq. miles (2,973,890 land, 52,899 water). The area of Alaska is 590,884 sq. miles; of the Hawaiian Islands, 6,449 sq. miles; of the Philippine Islands, 115,026 sq. miles; of Porto Rico, 3,435 sq. miles; of the Panama Canal Zone, 442 sq. miles; of Guam, 210 sq. miles; and of Samoa, 77 sq. miles.

II. STATE TAXATION, INDEBTEDNESS, REVENUES AND EXPENDITURES

(In Thousands of Dollars)

The figures in this table are taken from the report of the Bureau of the Census on "Financial Statistics of States," published for the first time in 1916. They relate to the fiscal year ending June 30, 1915, or to the first fiscal period prior thereto.

State	Assessed Valuation of Property	Total Tax Levy	Bonded Debt	Net Debt	Receipts		Expenditures	
					Revenue	Non-Revenue	Governmental Cost	Non-Governmental Cost
Alabama	$615,380	$4,387	$9,057	$36	$7,177	$2,322	$7,438	$2,004
Arizona	408,540	1,842	3,009	24	2,247	705	2,764	363
Arkansas	450,317	3,358	1,250	18	3,798	905	4,161	874
California	3,409,176	7,637	26,475	3,779	24,639	12,083	34,119	9,224
Colorado	1,306,647	2,167	3,642	501	3,640	4,246	4,189	3,976
Connecticut	1,814,453	5,204	11,064	4,000	7,491	7,545	9,975	5,260
Delaware	.....	213	751	13	856	278	848	319
Florida	285,860	1,646	601	2	3,107	620	2,998	634
Georgia	953,542	4,771	6,544	101	6,384	2,734	6,330	2,717
Idaho	425,196	1,121	2,390	34	2,078	1,936	2,000	1,874
Illinois	2,455,966	14,027	252	19	26,239	2,213	18,936	2,639
Indiana	1,968,900	8,533	1,051	159	10,705	3,393	10,458	3,372
Iowa	1,177,118	6,174	.....	.....	9,489	2,776	9,201	3,260
Kansas	2,804,810	3,689	159	81	5,816	4,369	5,934	4,384
Kentucky	1,162,353	6,551	6	55	8,046	6,308	8,670	5,653
Louisiana	581,788	5,469	18,048	3,222	8,735	17,864	9,898	14,769
Maine	622,350	3,410	1,061	523	5,795	1,234	6,137	994
Maryland	1,218,895	3,850	19,685	3,828	7,496	11,987	11,553	8,384
Massachusetts	5,798,211	15,917	122,963	2,638	24,050	29,130	26,775	26,500
Michigan	3,104,224	15,155	.....	4	17,703	6,040	18,264	3,093
Minnesota	1,695,601	7,750	2,603	165	19,470	7,037	16,557	7,982
Mississippi	441,497	2,648	2,969	1,250	4,942	3,059	5,115	2,555
Missouri	1,818,992	3,961	7,308	1,035	10,000	3,362	10,204	2,287
Montana	412,361	1,420	1,410	142	3,283	4,310	3,173	4,060
Nebraska	472,036	3,796	.....	.....	5,116	1,664	4,679	1,995
Nevada	139,109	843	300	.....	934	542	1,142	412
New Hampshire	439,213	1,576	1,071	9	2,418	1,598	2,128	1,687
New Jersey	2,635,825	14,406	.....	.....	17,999	2,970	18,381	3,230
New Mexico	84,086	1,188	2,605	74	1,946	1,443	1,384	1,754
New York	13,160,267	24,489	159,260	42,430	53,776	82,117	81,497	60,924
N. Carolina	807,672	2,483	8,753	518	4,706	2,881	5,003	2,781
N. Dakota	313,286	1,376	578	77	3,800	3,012	3,775	3,840
Ohio	7,537,486	6,277	1	2	20,849	3,618	18,644	1,842
Oklahoma	1,176,933	1,674	6,520	80	5,275	4,594	5,656	4,713
Oregon	954,282	4,471	.....	.....	4,540	1,090	4,597	1,007
Pennsylvania	.....	20,598	1,072	29	33,181	4,497	33,467	4,372
Rhode Island	851,129	1 259	6,917	1,030	3,244	1,411	3,482	524
S. Carolina	307,178	1,983	5,619	7	2,728	1,855	2,979	1,922
S. Dakota	1,221,420	1,276	.....	.....	3,203	2,312	3,195	2,355
Tennessee	672,754	2,831	1,195	243	5,134	12,250	5,522	12,360
Texas	2,743,078	11,928	4,077	.....	18,723	5,471	16,364	6,139
Utah	221,611	2,363	2,160	820	3,712	4,123	4,580	2,803
Vermont	383,540	1,820	159	8	2,630	1,813	2,780	1,799
Virginia	934,767	4,380	24,780	257	9,357	3,423	8,835	3,725
Washington	1,031,901	8,458	293	13	11,367	3,677	10,290	3,262
W. Virginia	1,276,690	2,136	.....	.....	3,264	4,904	3,686	4,449
Wisconsin	3,027,178	11,363	.....	.....	15,880	2,101	15,890	2,448
Wyoming	203,740	603	111	3	1,242	643	1,226	671

III. STATE CONSTITUTIONS

For the revision of the table of state constitutions on pp. 184–9 of the AMERICAN YEAR BOOK for 1910, it is necessary only to note that the following states have adopted popular initiative as a second means of proposing amendments: California (1911), Colorado (1910), Michigan (1913), Nebraska (1912), North Dakota (1914), and Ohio (1912) The data for Arizona and New Mexico, admitted as states in 1912, are as follows:

STATE	Date	METHOD OF ADOPTION		PRESENT METHOD OF AMENDMENT			PRESENT METHOD OF GENERAL REVISION	
		Framed by	Popular Ratification	Proposed by	Limitations	Popular Ratification	Convention Called by	Popular Ratification
New Mexico	1911	Convention	Yes	⅔ members of each house	Not more than three at one time	Majority equal to 40 per cent. of total vote in one-half counties	¾ of each house and popular vote	Majority of votes
Arizona	1911	Convention	Yes	(1) Majority of each house (2) Popular initiative		Majority vote on question	Popular vote	Majority vote

IV. STATE AND TERRITORIAL GOVERNORS

STATE OR TERRITORY	Governor	Capital	Length of Term	Term Expires	Salary
Maine	*C. E. Milliken*	Augusta	2	January, 1919	$5,000
New Hampshire	*H. W. Keyes*	Concord	2	January, 1919	3,000
Vermont	*H. F. Graham*	Montpelier	2	January, 1919	2,500
Massachusetts	*S. W. McCall*	Boston	1	January, 1918	10,000
Rhode Island	*R. L. Beeckman*	Providence	2	January, 1919	3,000
Connecticut	*M. H. Holcomb*	Hartford	2	January, 1919	5,000
New York	*C. S. Whitman*	Albany	2	January, 1919	10,000
New Jersey	*W. E. Edge*	Trenton	3	January, 1920	10,000
Pennsylvania	*M. G. Brumbaugh*	Harrisburg	4	January, 1919	10,000
Delaware	*J. G. Townsend*	Dover	4	January, 1921	4,000
Maryland	E. C. Harrington	Annapolis	4	January, 1920	4,500
Virginia	H. C. Stuart	Richmond	4	February, 1918	5,000
West Virginia	J. J. Cornwell	Charleston	4	March, 1921	5,000
North Carolina	T. W. Bickett	Raleigh	4	January, 1921	5,000
South Carolina	R. I. Manning	Columbia	2	January, 1919	3,000

Democrats in Roman; Republicans in *Italics*.

IV. STATE AND TERRITORIAL GOVERNORS—*Continued*

State or Territory	Governor	Capital	Length of Term	Term Expires	Salary
Georgia	Hugh M. Dorsey	Atlanta	2	June, 1919	$5,000
Florida	Sidney J. Catts	Tallahassee	4	January, 1921	6,000
Kentucky	A. O. Stanley	Frankfort	4	December, 1919	6,500
Tennessee	T. C. Rye	Nashville	2	January, 1919	4,000
Alabama	Charles Henderson	Montgomery	4	January, 1919	7,500
Mississippi	T. G. Bilbo	Jackson	4	January, 1920	4,500
Arkansas	C. H. Brough	Little Rock	2	January, 1919	4,000
Louisiana	R. G. Pleasant	Baton Rouge	4	April, 1920	7,500
Texas	J. E. Ferguson	Austin	2	January, 1919	4,000
Oklahoma	R. L. Williams	Oklahoma City	4	January, 1919	4,500
Ohio	J. M. Cox	Columbus	2	January, 1919	10,000
Indiana	*J. P. Goodrich*	Indianapolis	4	January, 1921	8,000
Illinois	*F. O. Lowden*	Springfield	4	January, 1921	12,000
Michigan	*A. E. Sleeper*	Lansing	2	January, 1919	5,000
Wisconsin	*E. L. Philipp*	Madison	2	January, 1919	5,000
Minnesota	*J. A. A. Burnquist*	St. Paul	2	January, 1919	7,000
Iowa	*W. L. Harding*	Des Moines	2	January, 1919	5,000
Missouri	F. D. Gardner	Jefferson City	4	January, 1921	5,000
Kansas	*Arthur Capper*	Topeka	2	January, 1919	5,000
Nebraska	K. Neville	Lincoln	2	January, 1919	2,500
South Dakota	*P. Norbeck*	Pierre	2	January, 1919	3,000
North Dakota	*L. J. Frazier*	Bismarck	2	January, 1919	5,000
Montana	S. V. Stewart	Helena	4	January, 1921	7,500
Idaho	Moses Alexander	Boise	2	January, 1919	5,000
Wyoming	J. B. Kendrick	Cheyenne	4	January, 1919	4,000
Colorado	J. C. Gunter	Denver	2	January, 1919	5,000
New Mexico	E. C. De Baca	Santa Fe	4	January, 1920	5,000
Arizona	*Thomas Campbell*	Phoenix	2	January, 1919	4,000
Utah	S. Bamberger	Salt Lake City	4	January, 1921	4,000
Nevada	Emmet Boyle	Carson City	4	January, 1919	4,000
California	H. W. Johnson[1]	Sacramento	4	January, 1919	10,000
Oregon	*James Withycombe*	Salem	4	January, 1919	5,000
Washington	Ernest Lister	Olympia	4	January, 1921	6,000
Alaska	J. F. A. Strong	Juneau	4	April, 1917	7,000
Hawaii	L. E. Pinkham	Honolulu	4	November, 1917	7,000
Porto Rico	Arthur Yager	San Juan	4	November, 1917	8,000
Philippine Islands	F. B. Harrison	Manila	Indef.		18,000

Democrats in Roman; Republicans in *Italics;* Progressive in Small Caps. [1] Elected to the U. S. Senate for the term beginning March 4, 1917; Lieutenant-Governor, Wm. D. Stephens.

	Number of Members		Length of Term (years)		Regular Sessions	Regular Session Begins	Limit of Session (days)	Salary
	Senate	House	Senate	House				
Maine	31	151	2	2	Biennial	January, 1917	None	$300 per year.
New Hampshire	24	402	2	2	Biennial	January, 1917	None	200 per term.
Vermont	30	246	2	2	Biennial	January, 1917	None	4 per day.
Massachusetts	40	240	1	1	Annual	January, 1917	None	1,000 per year.
Rhode Island	39	100	2	2	Annual	January, 1917	60	5 per day.
Connecticut	35	258	2	2	Biennial	January, 1917	5 mo.	300 per year.
New York	51	150	2	1	Annual	January, 1917	None	$1,500 per year.
New Jersey	21	60	3	1	Annual	January, 1917	None	500 per year.
Pennsylvania	50	207	4	2	Biennial	January, 1917	None	1,500 per year.
Delaware[1]	17	35	4	2	Biennial	January, 1917	60	5 per day.
Maryland	27	102	4	2	Biennial	January, 1918	90	$5 per day.
Virginia	40	100	4	2	Biennial	January, 1918	60[2]	500 per session.
West Virginia[1]	30	86	4	2	Biennial	January, 1917	45	4 per day.
North Carolina	50	120	2	2	Biennial	January, 1917	60	4 per day.
South Carolina	44	124	4	2	Annual	January, 1917	40	200 per session
Georgia	44	189	2	2	Annual	June, 1917	50	4 per day.
Florida	32	71	4	2	Biennial	April, 1917	60	6 per day.
Kentucky	38	100	4	2	Biennial	January, 1918	60	$10 per day.
Tennessee	33	99	2	2	Biennial	January, 1917	75	4 per day.
Alabama	35	106	4	4	Quadrennial	January, 1919	50	4 per day.
Mississippi	45	136	4	4	Biennial	January, 1918	45	500 per session.
Arkansas	36	100	2	2	Biennial	January, 1917	60	6 per day.
Louisiana	41	118	4	4	Biennial	April, 1918	60	5 per day.
Texas	31	142	4	2	Biennial	January, 1917	60	5 per day.
Oklahoma	44	98	4	2	Biennial	January, 1917	60	6 per day.

Democratic legislatures in Roman; Republican in *Italics*. [1] Republican Senate; Democratic House. [2] Can be extended 30 days by ⅗ vote

State or Territory	Number of Members		Length of Term (years)		Regular Sessions	Sessions Begin	Limit of Session (days)	Salary
	Senate	House	Senate	House				
Ohio	33	123	2	2	Biennial	January, 1917	None	$1,000 per year.
Indiana[2]	50	100	4	2	Biennial	January, 1917	60	6 per day.
Illinois	51	153	4	2	Biennial	January, 1917	None	3,500 per session.
Michigan	32	100	2	2	Biennial	January, 1917	None	800 regular session. 5 per day, extra session.
Wisconsin	33	100	4	2	Biennial	January, 1917	None	500 per session.
Minnesota	67	130	4	2	Biennial	January, 1917	90	1,000 per session.
Iowa	50	108	4	2	Biennial	January, 1917	90	1,000 regular session. 10 per day, extra session.
Missouri	34	142	4	2	Biennial	January, 1917	70	5 per day.
Kansas	40	125	4	2	Biennial	January, 1917	50	3 per day.
Nebraska	33	100	2	2	Biennial	January, 1917	60	600 per session.
South Dakota	45	104	2	2	Biennial	January, 1917	60	5 per day.
North Dakota	49	112	4	2	Biennial	January, 1917	60	5 per day.
Montana[1]	41	93	4	2	Biennial	January, 1917	60	$10 per day.
Idaho	33	61	2	2	Biennial	January, 1917	60	5 per day.
Wyoming	27	57	4	2	Biennial	January, 1917	40	8 per day.
Colorado	35	65	4	2	Biennial	January, 1917	90	1,000 per session.
New Mexico	24	49	4	2	Biennial	January, 1917	60	5 per day.
Arizona	19	35	2	2	Biennial	January, 1917	60	7 per day.
Utah	18	45	4	2	Biennial	January, 1917	60	4 per day.
Nevada[1]	22	53	4	2	Biennial	January, 1917	60	10 per day.
California	40	80	4	2	Biennial	January, 1917	§	1,000 regular session. 10 per day, extra session.
Oregon	30	60	4	2	Biennial	January, 1917	40	3 per day.
Washington	42	97	4	2	Biennial	January, 1917	60	5 per day.
Alaska	8	16	4	2	Biennial	March, 1917	60	$15 per day.
Hawaii	15	30	4	2	Biennial	February, 1917	60	$600 per session.
Porto Rico	11	35	4	2	Annual	February, 1917	60	5 per day, members of House. 3,000 per year for 4 members of Senate, 5 serving without pay.
Philippine Islands	24	90	6	3			100	

Democratic legislatures in Roman; Republican in *Italics*. [1] Republican Senate, Democratic House. [2] Democratic Senate, Republican House.
§ Split session; first part 30 days; recess 30 days; no limit to second part.

State	Highest State Court					Other Courts				
	Name of Court	No. of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists.	No. of Judges	Term (years)	How Chosen
Maine	Supreme Court	8	7	Gov. and Council	$5,000	Nisi Prius	.....	.....	.....	.....
						Superior Courts in 2 counties	.....	2	7	Gov. and Council
New Hampshire	Supreme Court	5	(a)	Gov. and Council	4,500	Superior Court	10	5	(a)	Gov. and Council
					4,000					
Vermont	Supreme Court	5	2	Legislature	4,000	County Courts	14	6	2	Legislature
Massachusetts	Supreme Court	7	(b)	Gov. and Council	10,500	Superior Court	.....	28	(b)	Gov. and Council
					10,000					
Rhode Island	Supreme Court	5	(c)	Legislature	6,000	Superior Court	.....	7	(c)	Legislature
						District Courts	12	13	3	Legislature
Connecticut	Court of Errors	5	8	Gov. and Legislature	8,000	Superior Court	8	11	8	Gov. and Legis
						Court of Common Pleas in 5 counties		9	4	Gov. and Legis.
New York	Court of Appeals	7	14	Elected	$14,200	Appellate Division	4	22	.....	.....
					13,700	Supreme Court	9	104	14	Elected
						County Courts	.....	.....	6	Elected
New Jersey	Court of Errors and Appeals	16	7	Gov. and Senate	13,000	Chancery	.....	9	7	Gov. and Senate
					12,000					
						Supreme Court	9	9	7	Gov. and Senate
						Circuit Court	6	6	7	Gov. and Senate
						County Courts	.....	.....	.....	Gov. and Senate
Pennsylvania	Supreme Court	7	21	Elected	13,500	Superior Court	5	7	10	Elected
					13,000	Court of Common Pleas	.....	.....	.....	.....
Delaware	Court of Errors and Appeals	6	12	Gov. and Senate	5,000	Chancellor	.....	.....	12	Gov. and Senate
Maryland	Court of Appeals	8	15	Elected by Districts	$6,800	Circuit Courts	8	22	15	Elected
						Special Courts, in Balt.	.....	.....	.....	.....
Virginia	Supreme Court of Appeals	5	12	Legislature	5,200	Circuit Courts	31	31	8	Legislature
					5,000					
West Virginia	Supreme Court of Appeals	5	12	Elected	5,500	Circuit Courts	21	22	8	Elected
North Carolina	Supreme Court	5	8	Elected	4,650	Superior Court	16	16	8	Elected
South Carolina	Supreme Court	5	8	Legislature	3,000	Circuit Courts	14	14	8	Legislature
Georgia	Supreme Court	6	6	Elected	4,000	Court of Appeals	3	6	6	Elected
						Superior Court	28	31	4	Elected
Florida	Supreme Court	5	6	Elected	4,500	Circuit Courts	13	14	4	Gov. and Senate
						County Courts	.....	.....	.....	.....

(a) Until 70 years of age. (b) During good behavior. (c) Until removed by the legislature.

State	Highest State Court					Other Courts				
	Name of Court	No. of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists.	No. of Judges	Term (years)	How Chosen
Kentucky	Court of Appeals	7	8	Elected by districts	$5,000	Circuit Courts	35	43	6	Elected
Tennessee	Supreme Court	5	8	Elected	5,000	Court of Civil Appeals	.....	5	8	Elected
						Chancery Court	14	14	8	Elected
						Circuit Courts	18	18	8	Elected
						Criminal Court	8	8	8	Elected
Alabama	Supreme Court	7	6	Elected	5,000	Chancery Courts	5	5	6	Elected
						Circuit Courts	16	16	6	Elected
Mississippi	Supreme Court	3	9	Gov. and Senate	4,500	Chancery Courts	.....	.....	4	Gov. and Senate
						Circuit Courts	13	.....	4	Gov. and Senate
Arkansas	Supreme Court	5	8	Elected	4,000	Circuit Courts	17	.....	4	Elected
Louisiana	Supreme Court	5	12	Elected	6,000	Circuit Courts of Appeals	4	9	8	Elected
						District Courts	30	32	4	Elected
Texas	Supreme Court	3	6	Elected	5,000	Court of Criminal Appeal	.....	3	6	Elected
						Courts of Civil Appeals	9	27	6	Elected
						District Courts	.....	.....	4	Elected
Oklahoma	Supreme Court	5	6	Elected	4,000	Criminal Court of Appeals	3	3	6	Elected
						District Courts	27	27	4	Elected
Ohio	Supreme Court	7	6	Elected	$6,500	Courts of Appeal	8	24	6	Elected
						Courts of Common Pleas	.....	.....	6	Elected
Indiana	Supreme Court	5	6	Elected	6,000	Appellate Courts	2	6	4	Elected
						Circuit Courts	92	92	6	Elected
						Superior Courts in 10 count's	.....	14	4	Elected
Illinois	Supreme Court	7	9	Elected	10,000	Courts of Appeal	4	15	.....	.....
						Circuit Courts	18	65	6	Elected
						County Courts	102	102	4	Elected
Michigan	Supreme Court	8	8	Elected	7,000	Circuit Courts	39	49	6	Elected
Wisconsin	Supreme Court	7	10	Elected	7,500	Circuit Courts	20	25	6	Elected
Minnesota	Supreme Court	5	6	Elected	7,000	District Courts	19	41	6	Elected
Iowa	Supreme Court	7	6	Elected	6,000	District Courts	21	59	4	Elected
Missouri	Supreme Court	7	10	Elected	7,500	Courts of Appeal	3	9	12	Elected
						Circuit Courts	38	65	6	Elected
Kansas	Supreme Court	7	6	Elected	4,000	District Courts	38	42	4	Elected
Nebraska	Supreme Court	7	6	Elected	4,500	District Courts	18	30	4	Elected
South Dakota	Supreme Court	5	6	Elected	3,000	Circuit Courts	12	12	4	Elected
North Dakota	Supreme Court	5	10	Elected	5,000	District Courts	12	12	4	Elected

VI. STATE JUDICIARY—*Continued*

State	Highest State Court					Other Courts				
	Name of Court	No. of Judges	Length of Term (years)	How Chosen	Salary	Name	No. of Dists.	No. of Judges	Term (years)	How Chosen
Montana	Supreme Court	3	6	Elected	$6,000	District Courts	17	24	4	Elected
Idaho	Supreme Court	3	6	Elected	5,000	District Courts	9	12	4	Elected
Wyoming	Supreme Court	3	8	Elected	5,000	District Courts	7	7	6	Elected
Colorado	Supreme Court	7	6	Elected	5,000	District Courts	13	.....	6	Elected
						County Courts	.....	.....	.....	.....
New Mexico	Supreme Court	3	8	Elected	6,000	District Courts	8	8	6	Elected
Arizona	Supreme Court	3	6	Elected	5,000	Superior Courts	14	14	4	Elected
Utah	Supreme Court	3	6	Elected	5,000	District Courts	7	12	4	Elected
Nevada	Supreme Court	3	6	Elected	6,000	District Courts	10	10	4	Elected
California	Supreme Court	7	12	Elected	8,000	Courts of Appeal	3	9	12	Elected
						Superior Courts	58	98	4	Elected
Oregon	Supreme Court	5	6	Elected	4,500	Circuit Courts	9	16	6	Elected
Washington	Supreme Court	9	6	Elected	6,000	Superior Courts	58	45	4	Elected

VII. COUNTY OFFICERS

State	No. of Counties	County Bd., No. of Members	County Judge	Probate Judge	Prosecuting Attorney	Sheriff	Coroner	Clerk of Court	Register of Probate	County Clerk	Register of Deeds	County Auditor	County Assessor	County Treasurer	County Surveyor	Supt. of Schools	Supt. of Poor	Health Officer
Maine	16	3		El.	El.	El.	App.	El.	El.	.....	El.			El.				
New Hampshire	10	3		App.	El.	El.	App.	App.	El.	.....	El.	App.	El.	El.		El.	App.	App.
Vermont	14		El.	dist.	El.	El.		El.	App.	.....		App.		App.				
Massachusetts	14	3		App.	Dist.	El.	.....	El.	El.	.....	El.			El.				
Rhode Island	5	None				App.		App.										
Connecticut	8	App. 3	s.	dist.	App.	El.	App.	App.				App.		App.				App.
New York	62	Var.	El.	El.	El.	El.	El.	.....		El.	s.	s.		El.		dist.	App.	App.
New Jersey	21	Var.	App.	App.	App.	El.	El.	.....		El.	s.	App.		App.	App.	App.	s.	
Pennsylvania	67	3	El.	El.	El.	El.	El.	El.	El.	App.	El.	El.	El.	El.	El.	El.	s.	App.
Delaware	3	7–10		El.		El.	El.	El.	El.	.....	El.			El.	App.	App.	App.	App.
Maryland	24	3–7		El.	El.	El.	App.	El.		App.	El.			El.	El.	App.		App.
Virginia	100 / 18a	3–8		.....	El.	El.	App.	El.		El.	.....			El.	App.	App.	App.	App.
West Virginia	55	3			El.	El.	App.	El.		El.			El.		El.	El.	App.	App.

State	No. of Counties	County Bd., No. of Members	County Judge	Probate Judge	Prosecuting Attorney	Sheriff	Coroner	Clerk of Court	Register of Probate	County Clerk	Register of Deeds	County Auditor	County Assessor	County Treasurer	County Surveyor	Supt. of Schools	Supt. of Poor	Health Officer
North Carolina	100	3–5			Dist.	El.	El.	El.		.....	El.			El.	El.	App.	App.	App
South Carolina	44	Var.		El.	Dist.	El.	El.	El.		.....	s.	App.		El.		El.		App.
Georgia	152	3–5	sEl.	El.	Dist.	El.	El.	El.		El.	El.		App.	El.	El.	El.	s.	App.
Florida	52	5	El.	.....	Dist.	El.		El.					El.	El.	El.	El.		App.
Kentucky	120	3–8	El.	.....	El.	El.	El.	El.		El.			El.		El.	El.		App.
Tennessee	96	Var.	El.	.....	Dist.	El.	App.	El.		.....	El.	.....	s.	El.	App.	App.		App.
Alabama	67	5	.....	El.	Dist.	El.	El.	El.			.....		El.	El.	App.	El.		App.
Mississippi	79	5			El.	El.	El.	El.				El.	El.	El.	El.	El.		App.
Louisiana	64*b*	Var.			El.	El.	El.	El.		El.	.....		El.	App.	App.	App.		App.
Texas	252	3	El.	.....	El.	El.		El.		El.	.....	El.	El.	El.	El.	El.	App.	App.
Oklahoma	78	3		El.	El.	El.	El.			El.	El.		El.	El.	El.	El.	.....	App.
Arkansas	75	Var.	El.	.....	Dist.	El.	El.	El.		.....	.....		El.	El.	El.	App.		
Missouri	114	3		El.	El.	El.	El.	El.		El.	s.	s.	El.	El.	El.	El.		App.
Ohio	88	3	El.	El.	El.	El.	El.	El.		El.		El.	App.	El.	El.	App.		
Indiana	92	3(7)*c*	s.	s.	El.	El.	El.	El.			El.	El.	El.	El.	El.	App.	App.	App.
Illinois	102	Var.	El.	s.	El.	El.	El.	El.		El.	El.	.....	s.	El.	El.	El.	App.	
Michigan	83	Var.		El.	El.	El.	El.	.....		El.	El.	s.		El.	El.	El.	App.	
Wisconsin	71	Var.	El.	El.	El.	El.	El.	El.		El.	El.	.....	El.	El.	El.	El.	App.	App.
Minnesota	86	3–7		El.	El.	El.	El.	El.		.....	El.	El.		El.	El.	El.		.....
Iowa	99	3–7			El.	El.	El.	El.		.....		El.		El.	El.	App.	App.	App.
Kansas	105	3	El.	El.	El.	El.	El.	El.		El.	El.	App.		El.	El.	El.	App.	App.
Nebraska	93	Var.	El.	.....	El.	El.	El.	El.		El.	s.			El.	El.	El.		
South Dakota	63	3–5	El.	.....	El.	El.	El.	El.		.....	El.	El.	s.	El.	El.	El.		App.
North Dakota	50	3–5	El.	El.	El.	El.	El.	El.		.....	El.	El.	s.	El.	El.	El.		App.
Montana	41	3			El.	El.	El.	El.		El.	El.	El.	El.	El.	El.	El.		App.
Idaho	37	3		El.	El.	El.	El.	El.		.....	.....	.....	El.	El.	El.	El.		
Wyoming	21	3		.....	El.	El.	El.	s.		El.	.....		El.	El.	El.	El.		App.
Colorado	60	3–5	El.	.....	Dist.	El.	El.	.....		El.	.....		El.	El.	El.	El.	.....	.....
New Mexico	26	3		El.	Dist.	El.	.....	El.	El.		.....		El.	El.	El.	El.		.....
Arizona	14	3		El.	El.	El.	El.	El.		s.	El.		El.	El.	El.	El.		App.
Utah	27	3			El.	El.		.....		El.	El.	s.	El.	El.	El.	El.		
Nevada	16	3		.....	El.	El.	.....	.....		El.	El.	El.	El.	El.	El.	El.		
California*	58	3–7	El.	.....	El.	El.	El.	App.		El.	s.	El.	El.	El.	El.	El.		App.
Oregon	34	3		.....	Dist.	El.	El.	.....		El.	s.	El.	El.	El.	El.	El.		
Washington	39	3		.....	El.	El.	El.	.....		El.	.....	El.	El.	El.	El.	El.		App.

a. Cities. *b.* Parishes. *c.* 3 county commissioners; 7 members in the county councils. El., an elective county office. s., a county office in some counties. App., an appointive county office. ....., duties performed by some other officer. dist., elected or appointed for district smaller than a county. Var., number varies in different counties. Dist., elected or appointed for district larger than a county. * In Los Angeles county, the most populous county in California, the "short ballot" has been adopted. The only county officers elected by popular vote are the board of supervisors, auditor, district attorney, and assessor. All others are appointed by the board of supervisors.

STATE ADMINISTRATION

JOHN M. MATHEWS

Administrative Reform.—Developments in the field of state administration during 1916, though of a promising and substantial character, have not been unusually numerous or conspicuous. This has been due in part to the comparatively small number of legislative sessions held during the year, in part to the overshadowing interest in the national election, and in part to the conservative reaction which has been a noticeable tendency in recent American political history.

State Departments, Boards and Bureaus.—The increase in the number of new administrative agencies in the states has progressed recently at a somewhat less rapid rate than formerly. That the recommendations of state efficiency and economy commissions are beginning to bear fruit is shown by the increase in the number of legislative acts which undertake to consolidate various related agencies and services into unified departments. Thus the New Jersey legislature of 1916 passed acts providing for the reorganization of the Departments of Labor and Agriculture (Chs. 40, 268, 269). The act relating to the Department of Labor provided that there shall be a commissioner of labor appointed by the governor with the advice and consent of the Senate, who shall have general charge of the department. The work of the department shall be conducted in seven divisions or bureaus created by the act, as follows: inspection, structural inspection, electrical equipment, hygiene and sanitation, engineer's and firemen's licenses, industrial statistics, and employment. The acts relating to the Department of Agriculture created such a department to consist of a state Board of Agriculture, a secretary for agriculture, and bureaus of animal industry, of land, crops, and markets, and of statistics and inspection. It was also provided that there should be transferred to the newly created Department of Agriculture the powers and duties heretofore vested in the state Board of Agriculture, the state Board of Health, the state Commission on Tuberculosis among Animals, the state Live Stock Commission, the state plant pathologist, the state entomologist, and other commissions, boards and officers relating to the agricultural interests of the state and to the diseases of animals and plants and insects.

On the side of internal organization, state boards, commissions and administrative departments have been granted as yet comparatively slight power. Although the boards and departments, or their executive officers, usually have the power of appointing the administrative personnel or expert staff attached to the board, subject in some states to civil-service regulations, the number of persons on the staff, the grade and rank of each, and the amount of their compensation are matters which are usually determined by the legislature. It is possible, however, to discern evidences of a recent tendency to give state administrative agencies greater control over their internal organization. It is coming to be realized that, although the legislature should act as the critic of the administration with respect to the results of administrative action, it should not assume the rôle of dictator of the detailed methods and processes or means whereby the results shall be attained. A greater degree of flexibility in the laws recently passed to create or reorganize state administrative agencies may be noticed. Thus the recent act creating the New Jersey Board of Shell Fisheries vests in this Board power to create sub-departments or divisions to take charge of the different lines of work intrusted to it. It may appoint heads or chiefs of such divisions and fix their salaries as well as the salaries of all its employees. Moreover, the director of shell fisheries, with the approval of the Board, has the important power of abolishing any office or position under the board which, in his judgment, it may be unnecessary to retain (N. J., 1915, Ch. 387). In a New York case, reported during the year, it appeared that the superintendent of public works had discharged one of three reservoir tenders on the ground that the work could be done by the other two men with resulting economy of

operation. The court held that it is the right of such an official to abolish positions for reasons of economy, and that it is also his duty to abolish superfluous positions in his department (Edkins *v.* Wotherspoon, 158 N. Y. S., 710).

The flexibility of some recent laws relating to state administrative departments is also indicated by the grant of power to the department to transfer funds from one to another division of the work of the department and also to assign and transfer inspectors, clerks, and other employees from one bureau to another. The New Jersey act reorganizing the state Department of Labor, mentioned above, declares expressly that "the system of organization hereby created is intended to facilitate and not to retard the economical and efficient performance of the work of the Department, and not to impair the control or responsibility of the commissioner over and for such work." To this end the act empowers the commissioner to assign and transfer employees from one bureau to another and to fix their compensation. The act establishing the New Jersey state Department of Agriculture, mentioned above, vests in the Department power to create other bureaus in addition to those provided in the act, to assign to each of such bureaus its proper functions and to designate the officers and employees of whom such bureaus shall consist.

The consolidation of related administrative agencies and services into a unified department tends to decrease internal friction and to promote cooperative and efficient action. Even after consolidation, however, there may still be a lack of coöperation between the different departments remaining separate. This defect may be remedied either by placing a greater degree of control over the scattered departments in the hands of a common superior officer, such as the governor, or by providing specifically in the law for direct coöperative action between the different departments. The latter method is adopted in a significant act passed by the New Jersey legislature of 1916 (Ch. 49), entitled: "An Act to increase efficiency in the work of the several departments of the state, to promote coöperation between the same, and to provide for the expense of said coöperation." The act declares that:

> Whenever in the carrying on of the work of any department the services of any expert, or the use of any special apparatus shall be desired, or any work needs to be done for which said department is not equipped, the head thereof may request the assistance of any other department which may have the needed experts or apparatus, and it shall be lawful for the head of the department so called upon to coöperate in meeting said need so far as it can be done without detriment to the work. . . . Two or more departments may unite in coöperative work in lines germane to the duties of said departments, and the heads thereof may agree between themselves for the distribution of the expense to be incurred and the state comptroller shall make the necessary payments, or credits and debits.

Administrative boards and commissions sprang originally from standing committees of the legislature, and it is still the practice in some states for the legislature, in creating such commissions, to designate some of its own members to serve upon it. This practice, however, has received a setback in Illinois as the result of a decision recently handed down by the Supreme Court of that state, to the effect that the powers delegated by the legislature to a committee by a mere resolution cease upon the adjournment of the legislature *sine die*, and that long continued custom does not authorize the legislature to appoint by resolution committees to act after the session of the legislature has ended (Fergus *v.* Russell, 270 Ill., 304, 110 N. E., 130).

Although, in accordance with the principle of separation of powers, state administrative boards, departments and officers are supposed, in general, to exercise only executive or administrative powers, nevertheless they are also sometimes authorized by legislative enactment to exercise powers which partake of a quasi-judicial or subsidiary legislative character. The courts, although generally upholding the sacredness of the principle of separation of powers, have nevertheless not always applied the principle very strictly in passing upon the validity of the powers of such boards, departments and officers. For example, a South Carolina act of March 2, 1916, authorizing a state insurance commis-

sioner, was held not to be unconstitutional as conferring judicial duties upon him (Henderson *v.* McMaster, 88 S. E., 645), and a Texas law providing for compensation of employees and creating a state Industrial Accident Board to determine disputed claims was held not invalid as delegating judicial authority to the board (Middleton *v.* Texas Power and Light Co., 185 S. W., 556). Similarly, the legislature of Oregon was held to have power to confer judicial functions upon the Industrial Accident Commission of that state, created to administer the Workmen's Compensation Act (Evanhoff *v.* State Industrial Accident Commission, 154 Pac., 106). But, as showing that the courts are not unanimous in interpreting so broadly the powers of state administrative agencies, it was recently held that a provision of the California Workmen's Compensation Act was probably unconstitutional as conferring judicial powers on the commission (Western Metal Supply Co. *v.* Pillsbury, 156 Pac., 491).

Enforcement of State Law.—State administrative control in order to secure the enforcement of state law is a slow growth, being impeded by the prevalence of the idea of home rule and local control in such matters. The governor has little power of removing or suspending local officers charged with the enforcement of state law. A South Carolina statute which attempted to confer upon the governor power to suspend a sheriff for failure to enforce the provisions of the law relating to the prohibition of the sale of intoxicating liquors was recently held unconstitutional (State *v.* Hough, 87 S. E., 436). Another difficulty in the enforcement of state law arises from the prevalence of the jury system and the dominating influence which local sentiment is thus able to exercise in criminal cases. Dependence upon the jury in certain classes of cases, however, has recently been removed in a number of states through the enactment of what is known as the Iowa injunction and abatement law (*A. Y. B.*, 1915, p. 239). During 1916, New Jersey (Ch. 154) was added to the list of states having such laws, through the passage of an act declaring disorderly houses to be nuisances, and providing that either the public prosecutor or a private individual may maintain an action in the court of chancery to abate such nuisances. If the existence of the nuisance is established to the satisfaction of the court, a perpetual injunction shall be issued against it, and any violation of the injunction shall be punished as contempt of court. The law thus avoids the necessity of a jury trial by substituting therefor the action of the equity branch of the courts.

On account of the notorious violation of the Sunday-closing law in Kentucky, that state has found it necessary to strengthen the method provided for the enforcement of the law. By an act of 1916 (Ch. 14), it is provided that if local officers, such as the sheriff, mayor, and chief of police, fail to enforce the Sunday-closing law, they may be prosecuted by indictment or penal action and, upon conviction, shall suffer forfeiture of office. In case the local prosecuting attorney shall fail to institute proceedings against such recalcitrant local officials, the governor may direct the state attorney-general to do so in the same manner and with the same authority as the local prosecuting attorney would have to prosecute such action. In order to minimize the influence of local sentiment adverse to the enforcement of the Sunday-closing law, it is provided that the state or prosecution shall be entitled, equally with the defense, to a change of venue. This act does not give complete administrative control over the enforcement of state law, but it does represent a movement in that direction.

The business of conducting prosecutions for the violation of state law, even when in the hands of state rather than local officers, has often been divided between the attorney-general and the special attorneys attached to various state boards and commissions. Thus the legal business of the state has tended to become disintegrated. This tendency, however, has received a check in Illinois as the result of a decision recently handed down by the Supreme Court of that state. In the course of the opinion, the Court held that "except where the constitution or a constitutional stat-

ute may provide otherwise, the attorney-general is the sole official adviser of the executive officers and of all boards, commissions and departments of the state government," and, consequently, an appropriation to the state insurance superintendent for the legal services of special counsel is unconstitutional and void (Fergus *v.* Russel, 270 Ill., 304).

State Finance.—The pressure of public expenditures, the increasing cost of government and the resulting deficits in many states are directing attention more and more to the question of a state budget. This is evidenced by the utterances of several governors, who, in their messages of 1916, urged this matter upon the attention of the legislatures. Governor Beeckman of Rhode Island recommended that a canvass of the needs of state institutions be made prior to the legislative sessions, upon which to base the estimates; that appropriations fixed by statute, which, after such canvass, are not found to require change, should be made continuing appropriations; and that no important appropriation bills be introduced during the latter part of the session except upon the recommendation of the governor.

In spite of the defeat of the budget plan embodied in the proposed New York Constitution of 1915, Governor Whitman submitted a budget proposal to the 1916 legislature of that state, and recommended in his annual message that all appropriations for a fiscal year, except for emergencies, be included in one consolidated appropriation act. The legislature, however, did not carry out the recommendations of the governor, but passed a considerable number of special appropriation bills which, together with the general appropriation bills, considerably increased the total appropriations over those contained in the governor's original proposal. The legislature also passed the Sage-Maier bill, which was approved by Governor Whitman, and provides for a legislative, rather than an executive budget plan (Ch. 130).

A more promising budget bill is that passed by the New Jersey legislature of 1916 and known as the Edge bill (Ch. 15). It is required that requests for appropriations shall be submitted annually to the governor by all state departments, boards, and institutions, and the state comptroller and treasurer shall, at the same time, submit jointly to the governor a statement of the financial condition of the state, showing the income available for appropriations for the next year. At the opening of the session the governor is to transmit to the legislature in a special message a summary of such requests with his recommendations thereon. This message is to be in such form that it can be readily understood by the average citizen. All the appropriations made by the legislature are to be included in one consolidated appropriation bill. Provision is made also for the transfer of a part of a department's appropriation from one item to another. The New Jersey act thus provides for executive initiative and publicity and is a step in advance, but power over the public funds still rests mainly with the legislature.

Probably the most promising state budget plan yet brought forward in this country is that proposed in 1916 by the Goodnow Efficiency and Economy Commission of Maryland. It embodies the main features of the budget plan contained in the proposed New York Constitution, but works out more carefully and in more detail the respective functions of the governor and the legislature. It provides for effective administrative supervision over the estimates and gives the governor the power to determine the maximum amounts that shall be spent for the support of the state executive departments, boards and institutions. The estimated amounts necessary for the support of the judiciary and legislature are certified to the governor by the state comptroller and the presiding officers of each house respectively, and are inserted in the budget by the governor without revision, but public hearings are to be held on all estimates. The legislature may strike out items or reduce, but not increase, the amounts proposed by the governor for the support of the executive department; it may increase but not reduce those proposed for the support of the judicial department; and it may either increase or reduce the esti-

mates for the legislature. Moreover, while the legislature may not consider other appropriation bills until the governor's budget bill has been finally acted upon, it may subsequently initiate appropriations for objects not included in the governor's budget. The exercise of this power, however, is attempted to be safeguarded from abuse by the following conditions: It can be exercised only by a three-fifths vote; it is subject to the usual power of the governor to approve or veto; and the special appropriation bill must be accompanied by provision for the levy of a tax sufficient in amount to defray the expenses necessitated by such act of appropriation. If the governor's budget bill has not been acted upon by the legislature before the end of the regular session, the governor may extend the session for such further period as he thinks necessary, and during such extension of the session no matter other than such bill may be considered. The proposals of the Goodnow Commission were substantially embodied in a proposed constitutional amendment, which was passed by the legislature of Maryland in March, was submitted to the voters at the November election, and was adopted by them.

An executive state budget is calculated to introduce publicity and responsibility into state finance. In order to secure economy in expenditures, however, it is desirable that the budget system be supplemented by a more economical method of purchasing supplies. Several states have concentrated the authority to perform this function, and, to this list, New Jersey is now to be added. By a recent act (1916, Ch. 68) there is created the office of a state purchasing agent, who is appointed by the governor and senate, and is empowered to purchase, under the supervision of the State House Commission, all supplies needed by the various state departments and institutions. In exceptional cases, however, purchases may be made locally by the institutions.

References.—J. M. Mathews, *Principles of American State Administration* (New York, D. Appleton & Co.); *American Political Science Review*, x, 96-7; 557-563; New York Bureau of Municipal Research, Nos. 70 and 73, February and May, 1916; University of Oregon, *Commonwealth Review*, April, 1916.

AMENDMENTS TO STATE CONSTITUTIONS

On the following pages are given brief digests of the constitutional amendments submitted to the people of the various states during 1916, with the official returns of the votes thereon, and amendments pending before or passed by the state legislatures for submission in a subsequent year. Many of the important amendments are discussed in detail in other departments of the YEAR BOOK; full references will be found in the Index.

Alabama.—Submitted Jan. 18:

Amending Art. XI, Sec. 213, permitting the issuance of bonds for the refunding of the bonded debt of the state. Rejected, 29,308 for, 51,245 against.

Submitted November 7:

Amending Art. XI, Sec. 216, obliging the city of Selma to collect annually additional taxes of 0.3 per cent. for school purposes. Adopted.

Amending Art. XVII, Sec. 281, fixing the salaries, compensations and allowances to be paid to the officers of Montgomery County. Adopted.

Amending Art. XIII, by striking out Sec. 250, relating to the protection of bank depositors and note-holders. Adopted.

Amending Art. IV, Sec. 48, providing for biennial sessions of the legislature. Rejected.

Amending the constitution by adding Art. XIX, authorizing counties and districts to levy and collect a special tax not exceeding 30 cents on each $100 of taxable property. Adopted.

Amending the constitution, authorizing municipalities, with certain specified exceptions, to levy annually, with the approval of the qualified voters, a tax for general purposes, not exceeding 0.5 per cent. of the assessed valuation for state taxation in addition to the taxation permitted by Sec. 216 of the constitution of 1901. Rejected.

Arizona.—Submitted November 7:

Amending Art. IV, Sec. 1, providing that measures submitted under the initiative and referendum shall receive for passage a majority of the vote cast in the election. Rejected, 18,356 for, 18,961 against.

Amending Art. IV, Sub. 1, Sec. 1, providing for the abolition of the State

Senate. Proposed by initiative petition. Rejected, 11,631 for, 22,286 against.

Amending Art. IV, Sub. 2, Sec. 1, providing for the election of members of the state legislature by legislative districts. Proposed by initiative petition. Rejected, 15,731 for, 17,921 against.

Amending Art. IX, Sec. 2, providing that the property of widows shall be exempt from taxation not exceeding the sum of $2,000 when the total assessment does not exceed $5,000. Rejected, 14,296 for, 16,882 against.

Amending Art. XXIII by adding Sec. 4, providing for local option. Proposed by initiative petition. Rejected, 13,377 for, 29,934 against.

Adding Art. XXIV, prohibiting the importation or transportation within the state of intoxicating liquors for beverage purposes. Proposed by initiative petition. Adopted, 28,473 for, 17,379 against.

Adding Art. XXIV, providing for workmen's compensation. Proposed by initiative petition. Rejected, 18,061 for, 21,255 against.

Arkansas.—Submitted November 7:

Amending Art. V, Sec. 1, and Amendment No. 10 thereto, defining and enlarging the powers of the initiative and referendum. Proposed by initiative petition. Rejected, 69,817 for, 73,782 against.

Amending Art. XIV, Sec. 3, empowering the General Assembly by general law to authorize school districts to levy by a vote of the qualified electors a tax not to exceed 12 mills on the dollar in any one year, for school purposes. Proposed by initiative petition. Adopted, 108,173 for, 52,175 against.

Amending the constitution, empowering the county courts to levy taxes not exceeding three mills on the dollar and to issue bonds for the construction and maintenance of roads. Adopted, 82,753 for, 67,656 against.

Passed by the legislature of 1915 for subsequent submission (the constitution permitting the submission of only three amendments at one time):

Amending Art. XVI, Sec. 5, prescribing uniformity of taxation and authorizing the legislature to levy graduated taxes on incomes and on unimproved land.

Amending Art. XXI, extending the suffrage to women.

California.—Submitted November 7:

Amending Art. IV, Sec. 19, prohibiting members of the legislature from holding or accepting any office or employment under the state during the terms for which they are elected. Proposed by initiative petition. Adopted, 414,208 for, 230,360 against.

Amending Art. XIII, providing for the raising of all public revenues by taxation of land values, exclusive of improvements. Proposed by initiative petition. Rejected, 260,332 for, 576,533 against.

Adding Art. XXIV, prohibiting the manufacture, sale or possession of intoxicating liquors for beverage purposes after January 1, 1920. Proposed by initiative petition. Rejected, 436,639 for, 538,200 against.

Adding Art. XXIVA, prohibiting sale of intoxicating liquors in saloons and other places of public resort, limiting deliveries by manufacturers, and restricting transportation, after January 1, 1918. Proposed by initiative petition. Rejected, 461,039 for, 505,783 against.

Colorado.—Submitted November 7:

Amending Art. XII, Sec. 13, providing for the application of the merit system to appointments in the civil service. Proposed by initiative petition. Rejected, 64,458 for, 96,561 against.

Amending Art. XXII, Sec. 3, relating to the manufacture and sale of beer. Proposed by initiative petition. Rejected, 77,345 for, 163,134 against.

At the same election a proposal for the call of a constitutional convention was rejected by a vote of 53,530 to 69,579.

Connecticut.—Submitted in 1915 and 1916 to the electors in town meeting:

Amending Art. XXVII, Sec. 3, of the amendments, authorizing the General Assembly to provide by law for mileage allowance to members. Adopted, 22,459 for, 15,311 against.

Delaware.—Passed by the legislature of 1915, to be submitted to the legislature of 1917:

Amending Art. IX, Sec. 1, prohibiting special charters to corporations, except municipal corporations, banks, trust companies possessing banking power, and state-aided corporations for charitable, penal, reformatory or educational purposes.

Florida.—Submitted November 7:

Amending Art. VI, Sec. 1, prescribing residence, literacy, and property qualifications for the right of suffrage. Rejected, 10,518 for, 19,688 against.

Amending Art. VII, Secs. 2-4, relating to the election, term, and apportionment of members of the legislature. Rejected, 10,258 for, 17,774 against.

Amending Art. IX, Sec. 9, exempting from taxation property to the value of $500 of widows and disabled persons. Adopted, 20,859 for, 12,641 against.

Georgia.—Submitted November 7:

Amending Art. VI, Sec. 2, altering the Appellate Court system of the state. Adopted, 40,673 for, 16,794 against.

Amending Art. VI, Sec. 13, providing for additional compensation for the Superior Court judges of the Clarke, Floyd, Sumter and Muscogee Courts. Adopted, 38,623 for, 21,961 against.

Amending Art. VI, Sec. 13, abolishing fees of solicitors-general. Adopted, 50,358 for, 17,981 against.

Amending Art. VII, Sec. 2, authorizing the legislature to exempt from taxation vessels engaged exclusively in foreign commerce, owned and operated by Georgia citizens or corporations. Rejected, 34,087 for, 36,156 against.

Amending Art. XI, Sec. 1, creating the County of Bacon. Adopted, 49,237 for, 16,408 against.

Idaho.—Submitted November 7:

Amending Art. III, by adding Sec. 26, prohibiting the manufacture and sale of intoxicating liquors for beverage purposes within the state. Adopted, 90,576 for, 35,456 against.

Amending Art. IX, Sec. 8, providing for the annual sale of an increased acreage of school lands. Adopted, 64,973 for, 38,044 against.

Illinois.—Submitted November 7:

Amending Art. IX by adding Sec. 14, authorizing the legislature to provide for the classification of personal property for purposes of taxation. Adopted.

Iowa.—Submitted June 5:

Amending Art. II, Sec. 1, extending the suffrage to women. Rejected, 162,683 for, 173,024 against.

Submitted November 7:

Amending Art. II, Sec. 7, relating to the time of holding general elections. Adopted, 267,739 for, 139,780 against.

Passed by the legislature of 1915, to be submitted to the legislature of 1917:

Amending Art. I, prohibiting the manufacture and sale of intoxicating liquors for beverage purposes within the state.

Louisiana.—Submitted November 7:

Amending Art. 48, exempting from its provisions municipalities of more than 2,500 inhabitants, levee districts and parishes. Adopted, 31,139 for, 14,113 against.

Amending Art. 118, relating to juvenile courts. Adopted, 29,764 for, 15,026 against.

Amending Art. 129, relating to authorizing salaries for sheriffs, clerks, and other officials. Adopted, 39,655 for, 16,340 against.

Amending Art. 133, relating to the district court for the parish of Orleans. Adopted, 28,768 for, 15,340 against.

Amending Art. 148, relating to the election, qualifications, term and compensation of the District Attorney for the parish of Orleans. Adopted, 29,176 for, 14,753 against.

Amending Art. 210, relating to women holding office. Rejected, 17,636 for, 33,132 against.

Amending Arts. 225 and 226, relating to assessment and taxation, abolishing the Board of Appraisers. Adopted, 34,012 for, 20,909 against.

Amending Art. 270, relating to voting and levying of special taxes in aid of public improvements. Adopted, 30,232 for, 15,274 against.

Amending Art. 273, relating to public-service corporations. Adopted, 30,338 for, 15,694 against.

Amending Art. 287, relating to free passes for employees of the agricultural departments. Adopted, 30,426 for, 15,847 against.

Amending Art. 303, relating to the pensions for Confederate veterans. Adopted, 49,081 for, 11,215 against.

Amending the constitution providing for the funding of certain debts of the city of Shreveport. Adopted, 31,612 for, 15,268 against.

Amending the constitution, authorizing municipalities, parishes and wards to vote certain property taxes for the support of fairs. Adopted, 31,778 for, 15,948 against.

Amending the constitution, providing for the funding of certain debts of the city of New Orleans and the parish of Orleans. Adopted, 31,767 for, 17,098 against.

Amending the constitution, empowering the city of New Orleans to construct and operate bridges or tunnels across the Mississippi River. Adopted, 33,420 for, 14,421 against.

Amending the constitution, authorizing the Board of Levee Commissioners of the Orleans district to make certain constructions. Adopted, 30,446 for, 16,157 against.

Amending the constitution, exempting from taxation vessels engaged in foreign commerce, domiciled in a Louisiana port. Adopted, 31,279 for, 15,507 against.

Amending the constitution, funding the debt of the Penitentiary Board. Adopted, 30,501 for, 15,032 against.

Maryland.—Submitted November 7:

Amending Art. III, Sec. 52, providing for a budget system of appropriations. Adopted, 77,478 for, 37,100 against.

Massachusetts.—A proposal submitted by the legislature for the call of a constitutional amendment in 1917 was approved by a vote of 217,293 to 120,979. Delegates will be elected on the first Tuesday of May, 1917.

Michigan.—Submitted November 7:

Amending Art. V, Sec. 30, providing for the repeal of local or special acts in effect Jan. 1, 1909, by two-thirds vote of the legislature. Adopted, 283,823 for, 275,701 against.

Amending Art. XII by adding Sec. 10, relating to the incorporation, regulation and supervision of fraternal benefit societies with power to issue death benefit certificates. Proposed by initiative petition. Rejected, 225,220 for, 349,810 against.

Amending the constitution, prohibiting the manufacture or sale of intoxicating liquors within the state. Adopted, 353,378 for, 284,754 against.

Minnesota.—Submitted November 7:

Amending Art. I, Sec. 13, relating to the taking of private property for drain-

age purposes. Rejected, 132,741 for, 97,432 against.

Amending Art. IV, Sec. 1, providing for the initiative and referendum. Rejected, 187,711 for, 51,544 against.

Amending Art. IV, Sec. 11, permitting the approval in part by the Governor of single items of an appropriation bill. Rejected, 136,700 for, 83,324 against.

Amending Art. VI, Sec. 2, increasing the number of associate justices of the Supreme Court from four to six, and providing for the appointment of the clerk by the court. Rejected, 130,363 for, 108,002 against.

Amending Art. VI, Sec. 7, changing the length of the term of the judge of the Probate Court. Rejected, 186,847 for, 72,361 against.

Amending Art. VIII, Sec. 2, authorizing the setting aside of a revolving fund of not over 250,000 from the school and swamp land funds to be used in clearing such lands and improving them by roads, ditches and firebreaks. Adopted, 240,975 for, 58,100 against.

Amending Art. VIII, Sec. 6, authorizing the investment and loaning of school funds on improved farm lands within the state. Adopted, 211,529 for, 56,147 against.

Amending Art. IX, authorizing the legislature to provide by law for the protection and regulation of all public waters and rivers, and for the mining and sale of minerals situated therein. Rejected, 183,597 for, 64,255 against.

Missouri.—Submitted November 7:

Amending Art. IV, Sec. 47, empowering the legislature to provide by law for the pensioning of the deserving blind. Adopted, 385,627 for, 272,908 against.

Amending the constitution, empowering the legislature to create a state land bank with power to loan money on the security of agricultural lands. Proposed by initiative petition. Rejected, 296,964 for, 346,443 against.

Amending the constitution, prohibiting the manufacture, importation or sale of intoxicating liquors for beverage purposes after July 1, 1917. Proposed by initiative petition. Rejected, 294,288 for, 416,826 against.

Montana.—Submitted November 7:

Amending Art. XII, Sec. 2, authorizing the legislature to exempt from taxation evidences of debt secured by mortgages of record upon real or personal property. Rejected, 48,656 for, 83,198 against.

Amending Art. XII, Sec. 15, creating county boards of equalization and a state Board of Equalization and prescribing their powers and duties. Adopted, 74,257 for, 60,839 against.

Nebraska.—Submitted November 7:

Amending Art. V by adding Sec. 19B, placing the employees of the State Pure Food Department under the civil service. Proposed by initiative petition. Rejected, 91,215 for, 105,993 against.

Amending the constitution by adding Art. XVII, prohibiting the manufacture or sale of intoxicating liquors for beverage purposes. Proposed by initiative petition. Adopted, 146,574 for, 117,132 against.

Nevada.—Submitted November 7:

Amending Art. IX, Sec. 3, changing the state debt limit from $300,000 to one per cent. of the assessed valuation. Adopted, 16,368 for, 6,752 against.

Amending Art. XI, Sec. 3, relating to the use of certain revenues for educational purposes. Adopted, 17,492 for, 5,167 against.

New Hampshire.—A proposal of the legislature for the call of a constitutional convention submitted on Nov. 7 was adopted by a vote of 21,589 to 14,525.

New York.—Passed by the legislature of 1916, to be submitted to the legislature of 1917:

Amending Art. I, Sec. 6, relating to waiver of indictment and trial by jury in certain cases.

Amending Art. II, Sec. 1, extending the suffrage to women.

Amending Art. VI by adding Sec. 24, relating to the establishment of rules affecting practice, pleading and procedure in the courts.

Amending Art. VII, Secs. 4 and 11, relating to the period and payment of debts contracted by the state.

Amending Art. VII, Sec. 7, relating to the construction of state highways in the forest preserve.

Amending Art. VII, Sec. 8, relating to the sale or lease of a certain portion of the Erie canal.

Amending Art. VIII, Sec. 10, relating to the limitation of indebtedness of cities of the first class.

A proposal of the legislature for the call of a constitutional convention submitted on Nov. 7 was defeated by a vote of 506,563 to 658,269.

North Carolina.—Submitted November 7:

Amending Art. II, by adding Sec. 29, restricting local, private and special legislation. Adopted.

Amending Art. IV, Sec. 11, providing for the appointment of emergency judges to prevent delay in trials. Adopted.

Amending Art. VIII, Sec. 1, prohibiting the creation of corporations by special act. Adopted.

Amending Art. VIII, Sec. 4, imposing on the legislature the duty of providing general laws for organization of cities, towns and incorporated villages. Adopted.

North Dakota.—Submitted November 7:

Amending Art. XIX, Sec. 216, to provide for the establishment of a State Normal School at Dickinson. Adopted, 60,582 for, 43,334 against.

Amending Art. XIX, Sec. 21, to pro-

vide for the establishment of a State Hospital for the Insane at a place to be selected by the legislature. Adopted, 49,001 for, 44,356 against.

Passed by the legislature of 1915, to be submitted to the legislature of 1917:

Amending Art. XII, Sec. 183, relating to the debt limits of cities and other political divisions of the state.

Amending Art. XII, Sec. 185, authorizing the legislature to establish a state fund for loans on agricultural land.

Amending the constitution, authorizing the legislature to establish a state system of hail insurance.

Amending the constitution, requiring the concurrence of four of the five judges of the supreme court in any decision declaring legislative enactments or laws of the state unconstitutional.

Oklahoma.—Submitted August 1:

Amending Art. II, Sec. 19, prescribing a jury of 12 in capital cases, of eight in civil and criminal cases other than capital in courts of record other than county courts, and of six in county courts not courts of record; and providing that three-fourths of the jury may return a verdict in civil and all criminal cases less than felonies. Rejected, 49,954 for, 142,333 against.

Amending Art. VII, Sec. 7, relating to the appointment and duties of the clerk of the Supreme Court. Rejected, 58,933 for, 134,963 against.

Repealing Art. X, Sec. 12*a*, relating to taxes collected for maintenance of schools. Rejected, 76,093 for, 127,525 against.

Amending Art. X, Sec. 21, authorizing the creation of a State Tax Commission of three members and prescribing its powers and duties. Rejected, 50,656 for, 146,130 against.

Amending Art. X, Sec. 27, authorizing municipalities with the approval of three-fifths of the taxpaying voters to incur indebtedness for the purpose of acquiring public utilities. Rejected, 44,687 for, 147,933 against.

Amending Art. XXIII, Sec. 7, relating to the compulsory compensation of workmen. Rejected, 50,995 for, 139,132 against.

Amending the constitution, consolidating the Supreme Court and the Criminal Courts of Appeals in the Supreme Court of Oklahoma and prescribing its organization and procedure. Rejected, 42,896 for, 149,272 against.

Amending the constitution, relating to the original jurisdiction of the district courts in all civil and criminal cases. Rejected, 41,194 for, 157,284 against.

Amending the constitution, prescribing a literacy qualification for the suffrage. Proposed by initiative petition. Rejected, 90,605 for, 133,149 against.

Submitted November 7:

Amending Art. III, providing for tripartisan state, county and precinct election boards. Proposed by initiative petition. Rejected, 147,067 for, 119,602 against.

Amending the constitution, prohibiting the legislature from passing any law concerning the registration of electors, making the initiative the only method of enacting such law, and providing a registration system for cities and towns. Proposed by initiative petition. Rejected, 140,366 for, 114,824 against.

Oregon.—Submitted November 7:

Amending Art. I, Sec. 1, providing for a tax on land based on full rental value, and establishing a home-makers fund. Proposed by initiative petition. Rejected, 43,390 for, 154,980 against.

Amending Art. I, Sec. 36, permitting the manufacture and sale of fermented malt liquors containing four per cent. or less of alcohol. Proposed by initiative petition. Rejected, 85,973 for, 140,599 against.

Amending Art. I, Sec. 36, prohibiting the importation of intoxicating liquor for beverage purposes. Proposed by initiative petition. Adopted, 114,932 for, 109,671 against.

Repealing Art. II, Sec. 6, relating to the voting of negroes and Chinese. Rejected, 100,027 for, 100,701 against.

Amending Art. V, Sec. 15, empowering the Governor to veto single items in appropriation bills. Adopted, 141,773 for, 53,207 against.

Amending Art. IX by adding Section 1b, exempting from taxation, except for state purposes, until Jan. 1, 1935, all vessels of 50 tons or more, whose ports of registration are in the state of Oregon. Adopted, 119,652 for, 65,410 against.

Amending Art. XI by adding Sec. 11, limiting the tax levies of the state and its sub-divisions and the power of counties to incur indebtedness. Proposed by initiative petition. Adopted, 99,536 for, 84,031 against.

Amending the constitution by adding Art. XIA, authorizing a bond issue of not over two per cent. of the assessed valuation for the establishment of a rural credits fund. Proposed by initiative petition. Adopted, 107,488 for, 83,887 against.

Amending Art. XIV by adding Sec. 4, providing for the establishment of a State Normal School and ratifying the location of certain state institutions. Proposed by initiative petition. Rejected, 96,829 for, 109,523 against.

Pennsylvania.—Passed by the legislature of 1916, to be submitted to the legislature of 1917:

Amending Art. V, Sec. 6, consolidating the courts of common pleas in Philadelphia County.

Amending Art. IX, Sec. 4, authorizing the state to issue bonds to the amount of $50,000,000 for highway improvement.

Amending Art. IX, Sec. 8, relating to the debt limits of counties, townships, school districts and municipalities, and of the city of Philadelphia.

Amending Art. XVIII by adding Sec. 16, authorizing the state or municipalities to condemn property in excess of actual requirements for public purposes.

Rhode Island.—Submitted November 7:

Amending Art. XVII, Sec. 1, authorizing the state and municipalities to condemn property in excess of actual requirements for highway or park purposes. Adopted, 31,709 for, 6,786 against.

South Carolina.—Submitted November 7:

Amending Art. VIII, Sec. 7, adding a proviso relating to the bonded indebtedness of School District No. 1 of Kershaw County. Adopted.

Amending Art. VIII, Sec. 7, adding a proviso relating to the bonded indebtedness of the city of Anderson. Adopted.

Amending Art. X, Sec. 5, adding a proviso relating to the bonded indebtedness of the Charleston School District. Adopted.

Amending Art. X by adding Sec. 15, empowering the town of Mullins to assess abutting property for permanent improvements. Adopted.

Amending Art. X by adding Sec. 18, authorizing the town of Clinton and the city of Easley to assess abutting property for permanent improvements. Adopted.

Amending Art. XI, Sec. 5, by adding a proviso relating to Spartanburg County. Adopted.

Amending Art. XII, Sec. 2, providing for the appointment of a board of regents and of a superintendent for institutions for the insane. Adopted.

South Dakota.—Submitted November 7:

Amending Art. VII, Sec. 1, extending the suffrage to women. Rejected, 53,432 for, 58,350 against.

Amending Art. VIII, Sec. 9, authorizing the leasing of school land for a longer period than five years. Rejected, 41,379 for, 61,798 against.

Amending Art. XI, authorizing the legislature to classify property for purposes of taxation, limiting the tax levy to two mills for all purposes, authorizing taxation of the incomes of individuals and the franchises of corporations, and abolishing the taxation of the moneys, investments, and loans of banks. Rejected, 43,793 for, 55,568 against.

Amending Art. XIII, Sec. 1, authorizing the state, by the counties thereof, to establish a system of rural credits upon the security of real estate. Adopted, 57,569 for, 41,957 against.

Amending Art. XIII by adding Sec. 9, authorizing the state to engage in the construction and maintenance of roads, and the supplying of coal to the people of the state from state lands. Adopted, 75,922 for, 33,521 against.

Amending Art. XXI, Sec. 2, authorizing the legislature to regulate and fix the salaries of all elective state officers. Rejected, 39,169 for, 61,223 against.

Amending Art. XXI by adding Sec. 7, authorizing the legislature to provide for irrigation and the organization of irrigation districts. Adopted, 58,775 for, 44,238 against.

Amending Art. XXIII, Sec. 2, requiring the legislature of 1917 to provide by law for calling and holding a convention to revise the state constitution. Rejected, 35,377 for, 56,432 against.

Adding Art. XXIV, prohibiting the manufacture, importation or sale of intoxicating liquors for beverage purposes after July 1, 1917. Adopted, 65,334 for, 53,380 against.

Tennessee.—A proposal of the legislature for the call of a constitutional convention, submitted on Aug. 3, was defeated by 43,940 for to 67,336 against.

Texas.—Submitted November 7:

Amending Art. VII, Sec. 3, authorizing the levy of an *ad valorem* county tax, not to exceed 50 cents per $100 valuation of property for the maintenance of the public schools of the county, and the levy of an *ad valorem* district tax not to exceed $1 per $100 valuation of property for the maintenance of the public schools of the district. Rejected, 122,040 for, 129,139 against.

Utah.—Submitted November 7:

Amending Art. VII, Sec. 17, relating to the duties of the auditor and of the treasurer. Rejected, 18,103 for, 42,416 against.

Amending Art. XIII, relating to the taxation of mines. Rejected, 14,957 for, 55,133 against.

Washington.—Submitted November 7:

Amending Art. VI, Sec. 1, requiring that voters in elections for the authorization of bond issues shall be taxpayers. Rejected, 88,963 for, 180,179 against.

West Virginia.—Submitted November 7:

Amending Art. IV, Sec. 1, extending the suffrage to women. Rejected, 63,540 for, 161,607 against.

Amending Art. VIII, Sec. 23, prescribing the mode of election, term and compensation of commissioners of the county courts. Rejected, 80,674 for, 130,023 against.

Wisconsin.—Passed by the legislature of 1915 to be submitted to the legislature of 1917:

Amending Art. VI, Sec. 4, permitting sheriffs to succeed themselves.

Wyoming.—Submitted November 7:

Amending Art. VII, Sec. 6, authorizing the investment of funds held in trust by the state for educational purposes in first mortgages on farm lands. Adopted.

Amending Art. XVI by adding Sec. 9, authorizing the state to undertake the construction and improvement of roads and certain other works of internal improvement without special authorization of the electors. Adopted.

VII. MUNICIPAL GOVERNMENT

CLINTON ROGERS WOODRUFF

CHARTERS

Denver.—Under the Denver commission charter, no election was provided for any office in the spring of 1916. Certain voters, however, calling themselves the Denver Charter League, secured sufficient signatures to a petition to submit a proposition to adopt the city-manager plan. Friends of former Mayor R. W. Speer came into the field with another charter which not only transformed the existing commission form of government into the mayoralty form, but named Speer in the charter as the mayor to serve until June 1, 1919. This charter placed the legislative power in the hands of a council, consisting of nine members elected from nine districts, none of which was to contain a population of less than 15,000 persons. To avoid the expense of an additional election, however, five of the city's organizations (the Civic and Commerce Association, the Denver Trades Assembly, the Denver Real Estate Exchange, the Rotary Club and the Manufacturers' Association) were each given authority to appoint one member of the council, these five when appointed to serve with four to be named by the mayor until the next general city election in May, 1917. The Speer charter concentrated all administrative power in the hands of the mayor, giving him power and responsibility far exceeding that lodged in the mayor under the earlier charter under which Speer had served. Civil service was swept aside, except as to the fire and police department, which are covered by a state statute, the only examination provided for being one for competency to be taken by the employee after appointment. Another feature was the creation of an industrial bureau to encourage industries and the employment of labor, on the theory that business opportunities and the employment of labor are necessary to a city's growth and that a municipality should help to solve these problems.

No sooner had Speer, a Democrat in national politics, launched his charter and his mayoralty boom than the Republicans followed in his footsteps. They framed certain charter amendments providing for a return to the former mayoralty plan with a small council, and named W. W. Booth as their candidate for mayor. At the election on May 9, the voters had three charters before them, all involving the concentration of power in the hands of a single administrator, one along city-manager lines, the others giving specifically mentioned politicians great power with no safeguards. Speer carried the election by a large majority (about 10,000), the people seeming to be blind to every consideration other than to secure what they regarded as an efficient administration of the city's affairs.

Commission Government.—Besides Denver, Salem, Mass., after three-years experience, abandoned the commission form of government by a vote of the electors in November, 1915, and returned to a mayor and council. In September, 1916, Huntsville, Ala., took similar action. In addition to these successful attacks on the commission plan, the only three so far in the history of the movement, there was another unsuccessful attack in Spokane, the third in five years.

In most instances commission government has been adopted under some home-rule provision. The only states which impose commission government by means of a general law are Pennsylvania and Utah. The following states have optional laws: California (for cities under 10,000), Idaho, Illinois, Iowa, Kansas, Kentucky, Louisi-

ana, Massachusetts, Missouri, Mississippi, Montana, Nebraska, New Jersey, New Mexico, New York, North Dakota, Ohio, South Dakota, Texas (cities under 10,000), Virginia, Washington, Wisconsin and Wyoming.

The following is a list of cities adopting commission government since the list published in the YEAR BOOK for 1915 (p. 223):

	Population, 1910
Allenhurst, N. J.	306
Lambertville, N. J.	4,657
Montclair, N. J.	21,550
West Hoboken, N. J.	35,403
Girard, Ala.	4,214
Daytona, Fla.	3,082
Centralia, Ill.	9,680
Chenoa, Ill.	1,314
Chrisman, Ill.	1,193
East Peoria, Ill.	1,493
Mount Carmel, Ill.	6,934
Newton, Ill.	2,108
Oregon, Ill.	2,180
Olney, Ill.	5,011
Salem, Ill.	2,669
Ann Arbor, Mich.	14,817
Bessemer, Mich.	4,583
Green Bay, Wis.	25,236
Fredonia, Kan.	3,040
Kearney, Neb.	6,202
Mena, Ark.	3,953
Sinton, Tex.	1,500
Butte, Mont.	39,165
Helena, Mont.	12,515

Comparative Financial Statistics under Council and Commission Government.—Early in 1916 the Census Bureau issued an interesting comparison of the financial statistics of cities under the council and commission forms of government. Of the 24 cities compared, eight had the council form in 1913 and in 1915, eight had the commission form in these years, and eight the council form in 1913 and the commission form in 1915. The average size of the council cities was larger than that of the commission cities, while the latter were larger, on the average, than those of the third type. The comparisons are made in the form of *per capita* figures, which, however, do not put the three classes of cities upon a wholly comparable basis because of the tendency of municipal expenditures to increase faster than the population. The report presents a comparison of the property tax levies, the governmental cost payments, indebtedness, and assets. In the case of property tax levies, revenue receipts and governmental cost payments, the volume of expenditure *per capita* followed the grouping by population. The council cities led, with the commission cities second, though the tax levies of the latter were but little above those of the cities of the third type. In this there is a suggestion of relatively greater efficiency of the commission form of government. But the figures showing debts and assets are evidence on the other side. The commission cities had by far the largest average *per capita* debt—$56.94 in 1915, as against $46.00 for the council cities and $39.16 for those which have changed since 1913. Likewise the average *per capita* assets are lowest for the commission cities.

The City-Manager Plan.—There has been a steady growth of interest in the city-manager plan during the year. As the subjoined list will show, the number of city-manager cities is now 101, as compared with 82 reported in the YEAR BOOK for 1915 (p. 224). The City Managers Association is likewise developing in interest and influence. At the first convention in 1914 (*A. Y. B.*, 1915, p. 241), eight attended; at the second, held in Dayton, Nov. 17-20, 1915, 17 were present (see also *Municipal Organizations, infra*). The volume of its proceedings was thus described by Richard S. Childs in the *National Municipal Review:*

> This volume is ideal propaganda material for the commission-manager movement. It is packed with the concrete evidences of the successes of the managers and colored with their high purpose. The limp aimlessness of discussion in a typical mayors' conference is replaced by an earnest spirit of "Tell me just how you did it so I can do it too." There was genuine interchange of ideas and experiences, and the discussions were much more technical than the year before.

The following is a complete list of the cities operating under a form of city-manager government, with the names of the city managers so far as their appointments have been announced; those marked * adopted the system in 1916:

	Manager	Population, 1910
Norwood, Mass.	C. A. Bingham	8,014
Farmington, Conn.		3,478
Newburgh, N. Y.	Dr. Henry Wilson.	27,805
Niagara Falls, N.Y.	O. E. Carr	30,445
Oneida, N. Y.*	C. H. Brown	8,317
Sherrill, N. Y.*	Chester A. Brown.	.....

	Manager	Population, 1910
Watertown, N. Y.*	.....	26,730
Grove City, Pa...	H. B. McCune....	3,674
Titusville, Pa.....	H. A. Holstein....	8,533
Bristol, Va.....	G. M. Warren.....	6,247
Charlottesville, Va.	A. V. Conway.....	6,765
Fredericksburg, Va.	R. S. Royer.....	5,874
Graham, Va.*....	P. C. Nowlin.....	1,917
Luray, Va.....	Walter Campbell..	1,218
Portsmouth, Va..	.....	33,190
Staunton, Va.....	S. D. Holsinger....	10,604
Winchester, Va.*..	Arthur M. Field...	5,864
Charleston, W. Va.	B. A. Wise.....	22,996
Wheeling, W. Va..	.....	41,641
Williamson, W. Va.*.....	O. H. Booton.....	3,561
Durham, N. C....	.....	18.241
Elizabeth City, N. C.....	J. C. Commander..	8,412
Hickory, N. C....	J. W. Ballew.....	3,716
Morgantown, N. C.	C. T. Cain.....	2,712
Thomasville, N. C.	Frank D. Jones....	3,877
Beaufort, S. C....	H. G. Otis.....	2,486
Rock Hill, S. C...	J. G. Barnwell.....	7,216
Sumter, S. C.....	W. M. Blanding...	8,109
Lakeland, Fla....	D. F. McLeod....	3,719
Largo, Fla.....	G. J. Perkins.....	291
St. Augustine, Fla.	W. L. Miller.....	5,494
St. Petersburg, Fla.*.....	.....	4,127
Ashtabula, Ohio..	J. W. Prine.....	18,266
Dayton, Ohio.....	Henry M. Waite...	116,577
East Cleveland, Ohio*.....	.....	9,197
Kenmore, Ohio...	.....	1,561
Sandusky, Ohio...	Kenneth B. Ward.	19,989
Springfield, Ohio..	C. E. Ashburner...	46,921
Westerville, Ohio.	R. E. Blinn.....	1,903
Zanesville, Ohio*..	.....	28,026
Glencoe, Ill.....	H. H. Sherer.....	1,899
Winnetka, Ill.....	R. L. Fitzgerald...	3,168
Albion, Mich.*....	Roland Remley...	5,833
Alpena, Mich.....	Harrison G. Roby.	12,703
Benton Harbor, Mich.....	.....	9,185
Big Rapids, Mich.	Walter Willits.....	4,518
Cadillac, Mich....	T. V. Stephens....	8,375
Eaton Rapids, Mich.*.....	Fred. Moore.....	2,094
Grand Haven, Mich.....	I. R. Elliston.....	5,856
Grand Rapids, Mich.*.....	.....	112,571
Jackson, Mich....	G. C. Cummin....	31,433
Manistee, Mich...	C. E. Ruger.....	12,381
Petoskey, Mich.*.	.....	4,778
Horicon, Wis.....	Robert H. Polzin..	1,881
Morris, Minn.....	S. A. Siverts.....	1,685
Bloomfield, Iowa..	R. C. Bristow.....	2,028
Chariton, Iowa...	.....	3,794
Clarinda, Iowa...	T. A. Wilson.....	3,832
Grinnell, Iowa*...	A. M. H. Crosby..	5,036
Iowa Falls, Iowa..	E. L. Marriage....	2,797
Webster City, Iowa.....	H. G. Vollmer.....	5,208
Clark, S. D.....	J. E. Smith.....	1,220
Abilene, Kan.....	.....	4,118
Mulberry, Kan...	John W. Marion...	997
Cynthiana, Ky.*..	David Durbin.....	3,603
Jackson, Tenn.*..	.....	15,779
Johnson City, Tenn.....	P. F. McDonald...	8,502
Bentonville, Ark..	Edgar Masoner....	1,956
Collinsville, Okla..	F. A. Wright.....	1,324
Norman, Okla....	.....	3,724
LaGrande, Ore...	Fred. B. Currey...	4,843
Amarillo, Tex....	M. H. Hardin.....	9,957
Brownsville, Tex.*	Frank H. Williams	10,517
Brownwood, Tex.*	N. E. Dickerson..	6,967
Denton, Tex.....	S. G. Gray.....	4,732
San Angelo, Tex...	E. L. Wells, Jr....	10,321
Sherman, Tex.....	O. J. S. Ellingson..	12,412
Taylor, Tex.....	W. E. Dozier.....	5,314
Teague, Tex.*....	E. B. St. Clair....	3,288
Terrell, Tex.....	.....	7,050
Tyler, Tex.....	Clay Hight.....	10,400
Glasgow, Mont.*.	S. C. Moore.....	1,158
Durango, Col.....	A. P. Hood.....	4,686
Montrose, Col....	J. E. McDaniel...	3,252
Roswell, N. M....	W. M. Atkinson...	6,172
Phoenix, Ariz.....	R. A. Craig.....	11,134
Tempe, Ariz.....	M. C. Brinnig.....	1,473
Tucson, Ariz.....	C. K. Clark.....	13,193
Snohomish, Wash.	E. Colburn.....	3,244
Alameda, Cal.*...	.....	23,383
Alhambra, Cal....	C. E. Hewes.....	5,021
Bakersfield, Cal...	Wallace M. Morgan	12,727
Glendale, Cal.....	Thomas W. Watson	2,746
Holtville, Cal.....	D. A. Starbuck....	729
Inglewood, Cal...	Abandoned.....	1,536
San Diego, Cal...	F. M. Lockwood...	39,578
San Jose, Cal.....	Thomas H. Reed..	28,946
San Rafael, Cal...	F. J. Boland.....	5,934
Santa Barbara, Cal.....	.....	11,659
Maisonneuve, P. Q.	.....	.....
PowellRiver, B.C.*	R. H. Scanlon.....	.....

New Charters Proposed.—Los Angeles defeated another series of charter amendments on June 6, and immediately thereafter Mayor Sebastian appointed a new charter commission; sundry other amendments were submitted in November and defeated. Seattle adopted amendments to place city employees in extra-hazardous occupations under the provisions of the state compensation law and abolished ward boundaries; it defeated a preferential-voting amendment. East Cleveland adopted a city-manager charter and provided for woman suffrage, although the Ohio constitution provides that only male whites shall vote.

Springfield, Mass., has had an unique experience. On Nov. 7 she had the privilege of choosing between a city-manager charter and a highly responsible mayor-council form and chose the latter. At the municipal election in December, she had the privilege of choosing between that form and its existing charter and chose the latter.

Among other communities that have new charter movements are Philadelphia, Kansas City, Detroit, St. Paul, Richmond and Norfolk, Va., Baltimore, and Atlanta.

Model Charter of the National Municipal League.—The National Municipal League published in April a "Model City Charter." It is based on

the commission-manager form of government, and contains, in addition to carefully drawn sections on the legislative and administrative departments, model civil-service, finance and franchise provisions, as well as provisions for the initiative, referendum and recall; and for those cities desiring them, model proportional-representation and preferential-voting sections. Copies of the document may be had at the offices of the League, North American Building, Philadelphia.

Home Rule.—No state legislation or constitutional amendments pertaining to municipal home rule have been enacted during the year, largely because so small a number of state legislatures were in session. The application of existing home-rule statutes and provisions continues. In Baltimore there is a movement for a new charter under the home-rule amendment to the Maryland constitution (*A. Y. B.*, 1915, p. 222). The use of the power granted by the Ohio constitutional amendment continues to develop, a number of new home-rule charters having been adopted in the state during the year. The provisions of municipal home rule in Ohio were discussed by Mayo Fesler of the Cleveland Civic Club in the *National Municipal Review* for April. The question is up for consideration in Pennsylvania and in some of the Canadian provinces. It was an important issue in the Illinois gubernatorial and legislative campaign.

EFFICIENCY, RESEARCH, BUDGETS, AND ACCOUNTING

Progress in Municipal Budgets and Accounts.—In the July and October issues of the *National Municipal Review* an extended review of recent developments in the field of municipal budgets and accounts is given by C. E. Rightor, director of the Dayton Bureau of Municipal Research. Among the cities covered were Springfield, Mass., Boston, Philadelphia, Milwaukee, Chicago, Rochester, Cleveland, Cincinnati, Akron, Toledo, Columbus, Dayton, Springfield, Ohio, Denver, Jackson, Mich., St. Augustine, Fla., Dallas, Sherman, Tex., San Francisco, Oakland, Los Angeles, and Portland, Ore. In the course of his review Mr. Rightor said:

> Historically, it is to be noted that ten years ago appropriations were merely licenses to spend funds in amounts asked for by the department heads, without regard to actual needs. Later, appropriations were made according to classifications of functions or activities, and as to object of expenditure, and resulted in the highly segregated budget now found in New York City. The latest step, now proposed, is the lump-sum appropriations for departments, with definite restrictions as to the manner in which the money is to be expended. One fundamental difference between the segregated budget and this new form is that the former was developed with the idea of preventing misuse of public funds, whereas the prevailing idea now is to direct and facilitate public business.

Philadelphia.—Philadelphia enjoys, according to Mr. Rightor, one of the most complete accounting systems as a supplement to the budget procedure which is to be found. Expenditures are completely analyzed by fund, organization unit, function, character, and object. The difficulties in this city are those of charter provisions, which reduce the effectiveness of the budget system through a highly centralized executive organization, yet with the mayor unable to lead in securing measures for better administration, since the controller is the only official who by charter is permitted to submit the estimates to the Board of Aldermen, and no one is required to assume responsibility for a definite financial plan or proposal for the fiscal period. It is apparent that this is contrary to the theory of a budget, so far as its preparation goes. Nevertheless, in the budget statement of the city controller for 1916, full supporting data for Mr. Rightor's opinion are given. Expenditures for a three-year period are shown according to a uniform classification. Receipts are shown in comparison with the actual receipts of preceding years and also a five-years average, as required by act of the legislature. The budget statement includes also a consolidated balance sheet, a general account, capital account, sinking-fund, special and trust accounts, and comparative fund balance sheets, as supplementary information. So far as available

reports of budget procedure and the controller's annual report are concerned, Philadelphia stands as a model of completeness. (See also *A. Y. B.*, 1915, p. 227.)

Boston.—Boston's special committee of five citizens have submitted a report proposing a form for the annual budget. Their conclusion, as stated by them, is that the form proposed is "not a compromise, but a system which, for this city, will be distinctly superior to those in use elsewhere." One-half the budget, the subject of estimated revenue for financing the needs for the year, is omitted; possibly it is assumed that this portion of the budget will be prepared in full before the expenditure side is considered. Sufficient details are contemplated in the budget to show what is to be spent by the different departments for the various purposes of government, and to disclose the exact number of employees together with the maximum compensation. Responsibility is fixed for expenditure. The plan comprises, first, a set of estimate sheets; second, a revised appropriation order with an accompanying set of budget sheets, which are a condensation of the estimates; and, third, a revised form of monthly statements to be submitted by the departments. The result will be a budget much more condensed than that for cities having extreme itemization, due to the rejection of attempts to classify items by functions and to prescribe the number of divisions in larger departments. Departments are to keep a strict account of expenditures under each item of the appropriation order and to submit a report thereof monthly to the auditor.

Minneapolis.—The Bureau of Municipal Research of the Minneapolis Civic and Commerce Association completed during the year a survey of the business administration of the Board of Park Commissioners. One of the main recommendations of the report was that a central accounting division should be established to take charge of all accounts kept by the secretary of the Board and the superintendent of parks. The Board immediately accepted this suggestion, along with many other proposed changes.

A system of controlling appropriations installed on Jan. 1, 1915, by the city comptroller at the suggestion of the Bureau of Municipal Research enabled the city departments operating under the current expense fund to save approximately $140,000 in 1915. The departments had $120,000 less in appropriations during 1915 than in 1914, but they ended the year with a deficit of $14,000 as compared with the 1914 deficit of $35,000. The new system kept the officials informed of the unexpended and unencumbered balances of their appropriations.

Toledo.—Under the new charter of Toledo (*A. Y. B.*, 1914, p. 212) there is a Commission of Publicity and Efficiency whose duty it is to advise with the different departments as to their methods and to make such investigations as seem desirable in order to secure greater efficiency in the handling of the public business. It is also required to publish a *City Journal*, which, in addition to the legal advertising of the city, carries such matter of a civic interest as seems desirable to the Commission. This publication is running explanatory articles showing the workings of the different departments in Toledo, and other articles telling what other cities are doing along these lines.

Standardization of Salaries.—Chicago, Los Angeles, Pittsburgh (*A. Y. B.*, 1915, p. 226), and New York (*ibid.*) have made important contributions to the standardization of the salaries of city officials. In concluding a review of what has been accomplished in the July issue of the *National Municipal Review*, William C. Beyer says:

> It aims primarily to improve the administrative methods of utilizing human energy to the best advantage of both employees and the service. To that end it simplifies the problem of the legislative body by making available to legislators complete and reliable information to guide them in passing on salary changes. The wide discrepancies in rates of pay for similar positions unavoidable under the old methods and which proved so demoralizing to employees, can no longer appear if the standardization is adhered to in appropriations. At the same time the way is paved for a more flexible adjustment of salaries to individual needs than was formerly the case. The problem of the civil-service commission also is simplified. A classification of service based on duties and providing proper grades

for advancement makes possible a more equitable system of promotion than could obtain under the old grading scheme with haphazard salary rates as a basis. These improvements in the methods of dealing with the employment situation are bound in time to work salutary changes in the general tone and character of our municipal service.

Standardization of salaries, in Mr. Beyer's opinion, forms an essential part of two distinct programmes for improving the effectiveness of public administration. One is that of civil-service reform, which aims primarily to increase the efficiency of the personnel charged with carrying out the administrative functions of government. Civil-service commissions throughout the country have come to realize that the merit principle cannot be applied fairly and effectively to promotions within the public service unless something is done to correct the confusion and chaos in the average city payroll. The other programme is that of the efficiency movement, which concentrates attention mainly on procedure and method. The processes of internal administration are examined and readjusted to effect greater efficiency and economy in the operation of government. Budget making, accounting methods, purchasing procedure and similar matters of administration have been made subjects of inquiry and constructive study by efficiency bodies in many of our larger cities. Since the amount of money spent for personal service usually constitutes the biggest single item in a city's annual outlays, it is only natural that the payroll should be subjected to similar scrutiny and revision.

Two numbers of *Municipal Research* for Nov., 1915, and Aug., 1916, were devoted to a consideration of standardization of public employments.

CITY PLANNING

Collegiate Instruction in City Planning.—The growth of interest in city planning is indicated by the number of universities now giving courses on the subject. The following is a list of institutions which now offer such instruction: University of Illinois, chair of civic design; Harvard University, courses in the School of Landscape Architecture; University of Michigan, lectures in the Department of Landscape Architecture; University of Wisconsin, lectures in the Department of Engineering; Columbia University, lectures; Cornell University, occasional lectures in the Department of Landscape Architecture; Throop College of Technology, course listed but not yet given; University of Pennsylvania, courses in housing and city planning, and landscape architecture and design. The subject receives attention also in a course on municipal engineering at the University of Minnesota and in the Chicago School of Civics and Philanthropy.

Regulating Street Planning by Boards of Survey.—A Massachusetts act, approved May 10, 1916, gives (Ch. 190) the cities of that state authority to appoint "boards of survey" having arbitrary powers over the planning and location of streets and ways. These boards, when appointed, are to consist of three citizens, with the city engineer as clerk.

Model City-Planning Board.—A city-planning board to pass upon all proposed actions affecting the plan of the city is a feature of the model charter recommended by the National Municipal League. The city-planning article of the charter, as adopted, is as follows:

> There shall be a city-planning board of five members, consisting of the director of public works and utilities and two citizen members chosen because of their knowledge of city planning. [In larger cities having a director of utilities, a board of five members consisting of the directors of public works and of utilities and two citizen members is recommended.] It shall be the duty of the board to keep itself informed of the progress of city planning in this and other countries, to make studies and recommendations for the improvement of the plan of the city with a view to the present and future movement of traffic, the convenience, amenity, health, recreation, general welfare and other needs of the city dependent on the city plan; to consider and report upon the design and their relations to the city plan of all new public ways, lands, buildings, and bridges, and all other public places or structures, as well as all additions to or alterations in those already existing and the layout or plotting of new subdivisions of the city or of territory adjacent to or near the city.

All acts of the council or of any other branch of the city government affecting the city plan shall be submitted by the council to the board for recommendations.

Any matter referred by the council to the board shall be acted upon by the board within 30 days of the date of reference, unless a longer or shorter period is specified. No action by the council involving any points hereinbefore set forth shall be legal and binding until it has been referred to the board and until the recommendations of the board thereon have been accepted or rejected by the council.

The board shall submit to the council an annual report summarizing the activities of the board for the fiscal year, the recommendations made by it to the council during the year and the action of the council during the year on any and all recommendations made by the board in that or former years. The annual report of the board shall also contain a programme for improvements to the city plan year by year during at least the coming three years, with estimates of the cost thereof and recommendations as to how the cost shall be met.

The board shall appoint as secretary a person of skill and experience in city planning and may employ consulting city-planning experts as need may arise. The city engineer shall serve as chief engineer of the board, and it shall be his particular duty to make recommendations designed to bring all the engineering works of the city into harmony as parts of one comprehensive plan. The executive health officer of the city shall advise the board from time to time of any municipal improvements within the scope of the board which in his opinion would improve the healthfulness of the city. The board shall have power to call upon any branch of the city government at any time for information and advice which in the opinion of the board will insure the efficiency of its work.

Excess Condemnation.—To a large number of well informed persons the term "excess condemnation" conveys no intelligible idea. Even to the initiated the idea conveyed is somewhat nebulous. Reduced to its lowest terms, according to Robert E. Cushman of the University of Illinois, who is preparing a volume on the subject for the National Municipal League Series, excess condemnation is the policy by which a city condemns more land than is actually needed for a public improvement and subsequently sells or leases such surplus, sometimes to make a profit due to the increased value of the land, sometimes to control the use to which the land may be put. It is only within the last decade, however, that serious attention has been given in this country to the possible use of this policy, and until now excess condemnation has been a problem in constitutional law rather than a part of the working programme of the American municipality. Thus only the most fragmentary discussions of the subject have found their way into our periodical literature and no serious attempt has been made hitherto to present a thoroughgoing analysis of it. Nearly a dozen states, however, now have either constitutional provisions or statutes providing for excess condemnation and the subject has become one of deep and general interest. In recognition of that fact the committee on taxation of New York City published in 1916, along with its own recommendations, the report prepared a few years ago by Herbert S. Swan for the National Municipal League, brought up to date and greatly enlarged.

Sacramento.—The city commissioners of Sacramento, Cal., have unanimously adopted the city plan drawn by John Nolen. A few years ago there was so little sentiment in favor of city planning in Sacramento that the commissioners refused to make a donation of even $25 toward a fund to bring Dr. Hagemann to the city. The work which has been completed by Dr. Nolen at municipal expense required an appropriation of several thousand dollars. The California legislature, because of the educational campaign, by statute created a State Capital City Planning Commission whose duty it is to care for the interests of the state in the development of city planning in its capital city.

St. Louis.—Harland Bartholomew has been retained as expert by the Citizens City Plan Committee of St. Louis, which has begun the issue of a series of bulletins.

St. Augustine.—The new charter of St. Augustine, Fla., contains a unique provision of far reaching importance:

> The City Commission shall provide by ordinance for the establishment of a City Plan Board, the members of which shall serve without compensation, and it shall be the duty of such board to procure and suggest plans for the arrangement of the city with a view to its general improvement and probable future growth and demands, these plans to take into consideration the extension of the city

works into adjacent territory, improvement and changes in public utilities and lines of transportation, by surface and water; the location, widths and grades of highways necessary for the best treatment of the city; the development and improvement of the waterfront, with the seawall and wharves; the location and design of public buildings and municipal decoration and ornamentation and such further extension of and addition to the park and boulevard system as may be deemed advisable. The city plan proposed by such City Plan Board, when adopted by vote of the electors of the city in such manner as may be prescribed by ordinance, shall constitute the plan to be followed by the municipality and its officers in the permanent improvement and development of the city of St. Augustine, until modified or amended at some subsequent election, and all expenditures of funds for permanent improvements shall be restricted to such purposes as are contemplated under the plans of the City Plan Board which may have been approved and adopted as herein provided for.

Frederick Law Olmsted has been retained as the expert under this provision.

Building Zones and Restrictions in New York City.—The New York law of April 20, 1914, authorized (Ch. 470) the Board of Estimate and Apportionment of New York City to divide the city into districts and to regulate the heights of buildings, the area of courts and open spaces, the location of trades and industries, and the erection of buildings designed for specified uses. As a preliminary to the exercise of this authority, a commission on building restrictions and districts was appointed in June, 1914, with Edward M. Bassett, chairman; Lawson Purdy, vice-chairman; Robert H. Whitten, secretary; and George B. Ford, consultant. The commission with thoroughness undertook the exceedingly complicated studies necessary for an intelligent report and wisely secured coöperation from the various departments of the city government, as well as from the commercial and civic organizations of the city, and from financial, real-estate and other interests. Two reports (one tentative, dated March 10, 1916, and a final report dated June 2, 1916) were issued setting forth in detail the conclusions reached and the action recommended. On July 25 the Board of Estimate and Apportionment passed what is locally called the "Building Zone Resolution," regulating and limiting the height and bulk of buildings hereafter to be erected in New York. In addition to restricting skyscrapers, there are many important features affecting living and business conditions in every part of the city. The law is designed to check the invasion of retail districts by factories and residence districts by factories and business; to prevent an increase of the congestion of streets and of subway and street-car traffic in sections where the business population is already too great for the sidewalk and transit facilities; to prevent the overcrowding by manufacturing concerns of sections where the streets are insufficient for the vehicular traffic, and at the same time to concentrate manufacturing in locations where its products can be handled most efficiently and where its presence will not destroy real estate for residential and retail-business purposes; and to prevent congestion of street and transit facilities caused by housing a large population on a small area in a skyscraper. Restricting the size of buildings is a necessity from the standpoint of light and air, which are impaired by buildings of excess height, so the fundamental principle of providing air and light is followed out in building restrictions in all parts of the city. This ordinance is described by one student of city planning as the "greatest and most far reaching thing New York has ever done." (See also XXIX, *Architecture.*)

Zone Ordinance in Berkeley.—Berkeley, Cal., also has adopted a zoning ordinance which is regarded as an important contribution. It defines eight classes of districts or zones which may be formed by the passage of later ordinances, each locating a definite geographical district in which all property would be specifically limited to the use of the class designated. The only improvements permitted in these districts will be as follows: Class I, single-family residences; Class II, single or two-family dwellings; Class III, single or two-family or group dwellings with separate ground floor entrances and not more than two stories in height; Class IV, single, two-family or group dwellings

and boarding houses and clubs (of which there are a great number surrounding the University of California, located in Berkeley); Class V, all buildings permitted in Classes I, II, III and IV, and apartment houses, hotels and restaurants without display windows; Class VI, public buildings, such as churches, schools, parks, etc.; Class VII, ordinary industries, that are not obnoxious; Class VIII, industries of the heaviest type, which might prove obnoxious because of odors, smoke or noise.

Sacramento is another city which had adopted a zone ordinance.

Police Power of Cities to Establish Zones.—In a case of far reaching importance involving the legality of an ordinance of the city of Los Angeles prohibiting the operation of brickyards within a certain district, the Supreme Court of the United States in upholding its validity took occasion to review the respective rights of individuals and of the community. The Court in effect said (Hadacheck *v.* Sebastian, 36 Sup. C. Rep., 143):

> Governments often bring hardships on the individual. Men must give up their lives in battle that their government may live. Vast amounts of property of individuals are annually destroyed for the benefit of the community. The exercise of the police power frequently tramples under foot the right of a citizen for the benefit of other citizens. We cannot complain, for the government must be maintained. Otherwise, our citizenship would be held for naught. A certain law-abiding citizen buys a piece of land near the corporate limits of a growing city. His land contains valuable deposits of clay suitable for brickmaking. He develops such an industry. The city continues to prosper, and extends its boundaries to include his brickyards. Other citizens build fine homes in his locality, and finally, acting in a public spirit, they seek to suppress the manufacture of brick in the locality, because of the annoyance to them. A municipal ordinance is enacted in good faith as a police measure, prohibiting brickmaking within this designated area. Our first citizen has lost a profitable business in order that the community may enjoy a purer atmosphere. He appeals to the courts, and finally his contention reaches the Supreme Court, which says: "There must be progress, and if in its march private interests are in the way, they must yield to the good of the community. The logical result of petitioner's contention would seem to be that a city could not be formed or enlarged against the resistance of an occupant of the ground, and that, if it grows at all, it can only grow as the environment of the occupations that are usually banished to the purlieus.

City-Planning Conferences. — The eighth annual National Conference on City Planning was held in Cleveland on June 5-7, with the largest attendance in the history of the Conference. More than 60 cities and communities were represented by delegates; more public officials, including mayors, city engineers, and planning commissioners, were present; and real-estate interests were represented. The prominent operators of large subdivisions in more than a dozen cities were either present in person or were represented by their engineers or architects.

The principal ideas advocated were thus summarized by the *American City:*

1. Districting by municipal regulation as to height, area and use of buildings is coming to be generally recognized as a fundamental of city planning. The work being done by the Commission on Building Districts and Restrictions in New York City is worthy of emulation as to method of procedure; but other cities will make a serious mistake if they copy in their plans the actual restrictions proposed for New York.

2. The automobile has become a factor to be reckoned with most seriously in city planning. Width of streets, character of paving and methods of regulating traffic must be planned with increasing attention to the requirements of motor trucks and pleasure vehicles.

3. Progressive real-estate subdividers recognize the value of applying city-planning principles to land development. They recognize, too, that their own planning and restrictions can be made much more effective if coördinated with well considered plans for the city as a whole.

4. As the great majority of cities have less than 100,000 population, the Conference devoted two sessions to the problems of such cities. By planning now for future growth, the present generation can increase its own welfare and save the next generation the cost and discomfort of many surgical operations to the city plan.

5. City planning is only partly effective unless correlated with country planning. There is much to be said for the desirability of having in each state a central authority to prepare a statewide plan and to coördinate in some degree the town-planning work of the various municipalities.

Frederick Law Olmsted, of Brookline, Mass., was again chosen president; Nelson P. Lewis, of New York, vice-president; and Flavel Shurtleff, of Boston, secretary.

Massachusetts holds a city- and

town-planning conference, and also a metropolitan city- and town-planning exhibit which immediately follows the meeting of the former. The Massachusetts Commission (Henry Stirling, secretary) is responsible for the city-planning conference, but it has nothing to do with the exhibit. Massachusetts adopted in 1915 the so-called "homestead amendment," which makes the credit and funds of the state available for garden-city and housing purposes. The amendment was adopted by the largest favorable vote ever given a referendum in Massachusetts (*A. Y. B.*, 1915, p. 215), which is now embarking upon a phase of public service that has not heretofore appeared in this country. Massachusetts also has a federation of planning boards, of which Arthur C. Comey of Cambridge is secretary. Its 1916 meeting was held in Springfield in November, in conjunction with the National Municipal League.

A town- and city-planning association for Texas was organized in Dallas in June, with O. C. Ahrles as president and J. E. Surratt, Sherman, as secretary.

City-Planning Reports.—The most elaborate single publication of the year is Werner Hegemann's "Report on a City Plan for the Municipalities of Oakland and Berkeley." Detroit, Newark, New York, Philadelphia and St. Louis, however, all present a number of studies, carefully made, covering different phases of their special city-planning problems which make important contributions. In addition to these, there have come isolated reports from other cities on the aspects of the city plan that are locally pressing, thus continuing the tendency previously noted of dividing the city-plan study into sections instead of attempting to include the whole of it in one report; and finally an increasing number of annual reports from planning boards.

In the July and October issues of the *National Municipal Review*, Charles Mulford Robinson reviews at length the following more important recent reports: Oakland and Berkeley, Cal., "Report on a City Plan for the Municipalities of Oakland and Berkeley," by Werner Hegemann (1915); Pasadena, Cal., "Some Preliminary Suggestions for a Pasadena Plan" (Women's Civic League, 1915); Detroit, "Preliminary Plan of Detroit," by Edward H. Bennett, and "City Tree Planting: The Selection, Planting and Care of Trees along City Thoroughfares," by T. Glenn Phillips (Detroit City Plan and Improvement Commission, 1915); Newark, N. J., "A Public Recreation System for Newark," "Report of the Committee on Streets and Highways," and "Conference on Interurban Improvement of Newark and Adjacent Municipalities" (City Plan Commission, 1915); New York, "Development and Present Status of City Planning in New York City" (Committee on the City Plan, 1915); Philadelphia, reports of the Bureau of Surveys, Department of City Transit, and Department of Public Works on traffic problems (1911-1915); Lawrence, Mass., second annual report of the Planning Board, by Arthur Coleman Comey (1915); Brantford, Ont., "Preliminary Report to the Parks Commission on Future Development and Improvement," by H. B. and L. A. Dunington-Grubb (1914). Among the shorter and incidental reports should be mentioned those relating to the St. Louis central traffic parkway, river fronts and interurban loops; the reports of the Chicago Terminal Commission and Board of Supervisory Engineers; Burlington, Vt., and the Oranges, N. J., housing reports; the California recreation report; the reports of the Philadelphia art jury and of the Commission of Fine Arts; the Massachusetts Homestead Commission reports; and the Quincy, Mass., planning report.

Country Planning.—Country planning as a corollary to city planning is beginning to receive attention. The American Civic Association has issued a pamphlet on the subject by Frank A. Waugh and is coöperating with organizations like the Westchester (New York) Country-Planning Commission. At the annual meeting of the Garden Cities and Town Planning Association in England a very considerable measure of attention was given there to rebuilding the countryside. The secretary of the Association, Ewart G. Culpen, proposes to establish small-holding colonies of

a minimum of 100 families with capable supervision and necessary subsidiary industries on land acquired by the city to be let to the small holders.

The Reconstruction of Belgium.—At the same meeting the question of rebuilding Belgium (*A. Y. B.*, 1915, p. 232) was discussed. The convention was in agreement upon the following points:

1. That a general plan of Belgium be drawn up, including
   (*a*) A plan of roads, railways, and canals;
   (*b*) A plan of the towns partially destroyed;
   (*c*) A plan of the towns and villages entirely destroyed.
2. That these plans should be in harmony with the principles of the Garden Cities and Town Planning Association.
3. That the application of the existing laws and the form of the laws to be eventually introduced should be such as to constitute a compulsory minimum standard and that these laws should be so elastic as to be adaptable to the æsthetic and hygienic necessities as they may be clearly defined.
4. Any reconstruction whatever of the whole or part of a town which has been destroyed should be preceded by the drawing of a plan of lay-out, of extension and of improvement, which should determine the arrangement and the disposition of the different quarters, should fix the direction and width of the streets, the situation and area of the squares, public gardens, parks and other open spaces, should indicate those parts whether wooded or otherwise, to be used for hygienic or athletic purposes, and any other necessary conditions.
5. The procedure in connection with the drawing-up, the examination and the approval of the plan, should be as simple, economical, and rapid as possible.
6. The distribution of State grants should be made subject to the adoption and execution of plans of lay-out, extension and improvement.

HOUSING

Housing Reports.—Commenting on the housing reports of the year 1915-6 in the course of a review in the *National Municipal Review*, John Ihlder says:

> In adding this supplement to the list of reports on housing conditions which have already appeared in the *National Municipal Review*, the most significant point to note is the variety of sources from which these reports come, evidence of our growing realization that housing is a factor of first importance in many social and economic problems. Similar evidence is given in recent books on social and economic subjects.

First place belongs to social and civic organizations, which first awakened to the fact that we were creating slums in our cities which were a social and civic menace. So nearly exclusively did such reports once occupy the field, that housing has been, in the minds of many people, only a slum problem. Second place goes to government publications, for the U. S. Bureau of Labor, long before it became a Department, issued reports on housing problems. Now it is joined in this work by the Children's Bureau. These publications reflect public interest. Among the state governments, Massachusetts is a leader. Its Homestead Commission, starting with a peculiar care for workingmen as a class, has already given evidence that it recognizes in housing more than a class problem. Its report on government aid antedated that of the U. S. Department of Labor. Its annual conferences of city- and town-planning boards, for the creation of which it was responsible, show its growth.

Another evidence of the broadening interest in housing is given by the commercial organizations which have made investigations. The Cleveland Chamber of Commerce has long given attention to the subject. More recently the Minneapolis Civic and Commerce Association, the Passaic, N. J., Board of Trade, the Akron, O., Chamber of Commerce have entered the field. Business men are beginning to see that a well housed working population promises certain definite advantages to business.

It is only within the past two years that anti-tuberculosis societies have really awakened to the importance of good housing standards in their crusade. Among them is the Plainfield, N. J., league, which joined with the local charity organization society in financing a housing investigation. The Henry Phipps Institute has published a study of the housing and social conditions in selected districts of Philadelphia.

There is one other group of reports that must be specifically mentioned, those issued annually by agencies, of-

ficial and unofficial, which are devoting all or a definite part of their energies to housing betterment. This group includes the reports of the Massachusetts Homestead Commission, the Kansas City Board of Public Welfare, and the California Commission of Immigration and Housing. It also includes such reports as those of the New York Tenement House Department and the New Jersey Board of Tenement House Supervision, and in addition those of organizations like the Philadelphia Housing Commission, the Massachusetts Civic League, Trinity Church Corporation, New York, and the Philadelphia Octavia Hill Association.

The National Housing Association held its annual meeting in Providence, R. I., Oct. 10-13. Lawrence Veiller was reëlected secretary.

A National Health Campaign.—On March 8, 1916, the National Housing Association launched an active campaign for the improvement of housing conditions in the 250 largest cities of the country. A personal letter was addressed to the health officer of each of the cities in the United States having a population of 25,000 and over. The Association asked each health officer to do four things:

First.—To ascertain the facts as they exist in this city so that no one can hereafter say that the conditions are not known.

Second.—So to present those facts to his own community that the blame for failure to remedy bad conditions will thereafter rest upon the community itself and not upon the health officer.

Third.—To formulate a programme of constructive housing reform on the sanitary side, this to be taken up and given the attention by his department that it desires.

Fourth.—To summon to his aid the most representative citizens of his community, asking their support and assistance in combatting these evils which, as the health officer knows better than anyone else, strike at the very basis of the community's welfare.

California.—The state of California has become aroused to the evils and dangers of bad housing conditions, due largely to the activities of the California Commission on Immigration and Housing (Simon J. Lubin, chairman). At the 1915 sessions of the legislature the Commission sought the enactment of a thorough housing law covering all classes of dwellings, in place of the present tenement-house laws which relate only to the larger multiple dwellings. As the shack problem is one of California's most serious evils, the necessity for a housing law instead of a tenement-house law is probably greater in that state than in any other state in the Union, and one of the first acts of the Commission was to urge legislation on the subject. The bill introduced, however, did not receive favorable consideration by the legislature, as serious opposition to it arose from many cities in the state. The Commission has now devised the interesting plan of holding a series of housing institutes throughout the state, at which delegates from the larger cities and towns will meet with the members of the Commission and thresh out well in advance of the meeting of the Legislature the problems involved in the proposed housing law. In the meantime it is issuing a number of instructive pamphlets.

The Los Angeles Housing Commission held a conference during the year to aid in bringing about "thoughtful coöperation of the state, county and municipality with private individuals." In its call for this meeting the Commission said: "Los Angeles has 30,000 people housed in tenements, court houses and shacks which are designated by the Housing Commission as 'bad' either from a sanitary, structural, moral or social standpoint."

Pennsylvania.—The fourth conference of the Pennsylvania Housing and Town-Planning Association brought to Reading, Pa., on March 16-17, city-planning commissions, health officers and housing reformers. It was a purely state conference with all speakers from Pennsylvania. The Conference addressed itself to three chief topics: (1) the importance of the sanitary rating of municipalities; (2) beneficial possibilities for housing through city planning and how to inaugurate a city plan so as to make it serve another purpose than as a pretty design for exhibits; (3) housing standards that could be applied to the varied housing conditions of an industrial and mining town. Pennsylvania has a dozen companies

striving to build model workmen's homes.

Cincinnati.—Cincinnati, according to Lawrence Veiller of the National Housing Association, is experiencing a revival of interest in housing. This has been most notable in the tearing down in 1915 of 37 tenement houses, 26 of which had been condemned by the building commissioner. This set a new record. Also there were 79 compliances with orders for structural changes, as against six in 1914 and four in 1913. The number of new fire escapes put up was 214, as compared with 192 in 1914 and 78 in 1913, but there is only one housing inspector for each 100,000 citizens, or a total of four to cover an area of 72 sq. miles.

Notable progress has been made by the health department in compelling the abandonment of an increased number of privy vaults. From 1,200 vaults abandoned in 1911 to 3,889 in 1915, or a total of 12,598 in five years, through a force of 10 inspectors, with manifold duties, is an excellent record. It is estimated that there are approximately 7,000 vaults remaining, of which only 1,500 have sewer connections available.

Permissive legislation for a city-planning commission in Cincinnati was secured at the 1915 session of the Ohio Legislature. The City Council is now drafting an ordinance for the appointment of such a commission, which should have far reaching influence for better housing in future years. A Model Homes Co. has been organized to carry out, on a larger scale, J. G. Schmidlapp's plans for model dwellings.

Dallas.—The Department of Sanitation of Dallas, Tex., at the request of the State University, has made a housing study on one block along Mill Creek. As a result of a hearing before the Board of City Commissioners, it is proposed to appoint a sociological commission to study the question of race segregation, including a study of social and housing conditions in Dallas, so extending the scope of the investigation already made.

El Paso.—The El Paso, Tex., Chamber of Commerce has conducted a housing health survey of the poorer parts of the city. Dr. B. L. Arms of the University Medical College of Galveston, who made the survey, is quoted as saying that the Mexican quarter contains "the most beastly, crude and primitive housing conditions to be found in the United States." He recommends that the whole Mexican section be razed and rebuilt.

Fort Worth.—The results of a survey recently completed by the social-service committee of the Fort Worth, Tex., Federation of Women's Clubs, which covered 300 homes and included photographs and complete descriptions of ventilation, sanitation, food supplies and other data, have been forwarded to the University of Texas and will be used in an effort to obtain a model housing law for Texas.

Indianapolis.—A housing conference was held in Indianapolis on May 16 under the auspices of the National Housing Association and the Indiana Housing Association. The conference was unique in the fact that no papers were read. The entire time was given up to discussion informally by the whole conference of a series of live topics under four heads: "Laws and Law Enforcement," "What To Do and How To Do It," "Housing and Health," "Housing and City Planning."

Philadelphia.—As a consequence of the activities of the Philadelphia Housing Commission, 16,262 properties were forced to connect with sewers during the fiscal year 1915-6. A total of 13,738 complaints were filed during the year and all but 3,255 had been corrected at the end of the period. These complaints involved 7,898 properties and affected 46,834 persons, and it took 35,523 inspections to investigate them. In the division of rentals and repairs, the efforts to bring about improvement on properties resulted in 595 defects being corrected. These corrections cost the owners $11,200 and resulted in 21 houses being torn down.

The Octavia Hill Association has planned, built, and leased 48 workingmen's dwellings in Kensington, housing 48 families at rents of $8 and $10 per month for apartments and $13 a month for the one-family houses, the latter containing five rooms and bath and furnace.

Philadelphia has recently made a valuable addition to the store of information about its housing conditions by a survey of parts of the 11th, 12th and 16th wards. It shows that the average number of persons in these districts per acre, the acre including streets, parks, etc., is 125, while in the most densely populated spots there are probably as many as 250 per acre. Excluding the streets, the number of persons per acre amounts to twice this number. This congestion is largely due to the great number of back-lot houses.

"The Housing of the City Negro" is the title of a survey made by B. J. Newman for the Whittier Center. The Commission on Social Service of the Interchurch Federation has issued a pamphlet dealing with "Housing Reform and Community Welfare."

Pittsburgh.—The Housing Commission of the Pittsburgh Chamber of Commerce has organized a Sanitary Dwellings Co., capitalized at $100,000, to erect small one-family houses. The Commission has issued a pamphlet which tells how any one who wishes to improve housing conditions can help most effectively. John A. Sauer, superintendent of the Bureau of Sanitation, reports that during the last fiscal period 537 houses found unfit for human habitation have been razed, 195 have been repaired and 23 have been boarded up. The greater percentage of buildings razed was in the Twenty-second Ward, but the work of the department took in every section of the city. Real-estate men have been quick to grasp the opportunity offered by the lots thus made vacant. By July 1, 300 more houses in the city territory were razed, and those buildings now without fire escapes must provide them or suffer the penalty provided by the state law.

Housing Famine in Connecticut.—From all parts of Connecticut come reports of a housing famine, due, in most instances, to the sudden enlargement of manufacturing plants throughout the state for the manufacture of war materials of various kinds. There is hardly any part that is free from famine conditions, and tales of workers sleeping on the floors of railway stations, many families living in tents, rents soaring to prohibitive prices, appeals to the tax assessors to increase assessments to get even with landlords who increase rents, are some of the features of this interesting situation. Among the cities and towns where conditions seem to be most serious are Bridgeport, Waterbury, New London, Mystic, Bristol, Waterville and Watertown. In some of the Massachusetts towns similar conditions exist; similar reports come from Lowell and Newburyport.

Workmen's Dwellings.—The Amoskeag Manufacturing Co. of Manchester, N. H., is now building what is reported to be "some of the most remarkable buildings ever erected by a textile corporation for the purpose of housing employees." Each block is two stories high, of brick construction, and has accommodations for eight families, each family being provided with six rooms and bath. Every device has been employed to make the houses attractive, light and airy, and they are to be furnished with electric light, hot and cold water, and gas. They will provide in all for about 40 families. One of the interesting features of this development is that these houses replace some old wooden shacks used in former years for tenement purposes.

FIRE PREVENTION

Fire Losses.—The National Board of Fire Underwriters' figures for *per capita* losses in the cities of the United States having an average population of 100,000 or more during the five years from 1910 to 1914 inclusive show that the size of the city has but little bearing on the fire losses figured on a *per capita* basis, which, it is alleged, is the only way they can be figured for comparative purposes. Philadelphia, the third largest city in the United States, has a remarkably low record, while Boston, the fifth largest city, has a very high record.

The people of this country are apparently just beginning to realize

that it is better to prepare against fire than to be satisfied that they are "well insured." The demand for fire-proof building materials is constantly increasing and new fire-proof products are put on the market at very frequent intervals. While the losses in this country in 1915 were $50,000,000 less than in 1914, there was still a loss of $172,000,000; a continuation of the vigorous campaign for "preparedness" against fire should show another remarkable reduction in the losses in 1916 as compared with the preceding year. (See also XIV, *Property and Casualty Insurance.*)

The figures of *per capita* fire losses in 1915 in cities over 100,000 in population are as follows:

Bridgeport, Conn	$0.75
New Bedford, Mass	1.28
Fall River, Mass	1.35
Richmond, Va	1.40
Toledo, Ohio	1.46
Rochester, N. Y	1.47
Columbus, Ohio	1.55
Oakland, Cal	1.55
Scranton, Pa	1.57
Philadelphia, Pa	1.59
Denver, Col	1.64
Baltimore, Md	1.70
Washington, D. C	1.70
Lowell, Mass	1.71
Cleveland, Ohio	1.76
Cambridge, Mass	1.85
New York, N. Y	1.85
Grand Rapids, Mich	1.97
Jersey City, N. J	1.99
Pittsburgh, Pa	2.02
San Francisco, Cal	2.28
Worcester, Mass	2.29
Buffalo, N. Y	2.31
Providence, R. I	2.31
Syracuse, N. Y	2.34
Milwaukee, Wis	2.36
Chicago, Ill	2.52
Hartford, Conn	2.55
New Haven, Conn	2.55
Louisville, Ky	2.58
Atlanta, Ga	2.60
St. Louis, Mo	2.63
Detroit, Mich	2.66
Indianapolis, Ind	2.66
St. Paul, Minn	2.75
Newark, N. J	2.80
Los Angeles, Cal	2.95
Paterson, N. J	3.02
Seattle, Wash	3.02
Cincinnati, Ohio	3.08
San Antonio, Texas	3.19
Nashville, Tenn	3.48
Dayton, Ohio	3.51
Omaha, Neb	3.64
Albany, N. Y	3.71
Spokane, Wash	3.96
Kansas City, Mo	4.14
Memphis, Tenn	4.25
Minneapolis, Minn	4.28
Portland, Ore	4.33
Boston, Mass	4.38
Birmingham, Ala	5.10
Dallas, Texas	5.80

Conflagrations of the Year.—During the year 1916 the United States was free from large conflagrations with the exception of a series of three which by a remarkable coincidence occurred practically simultaneously. On March 21 the city of Augusta, Ga., and on March 22 the cities of Paris, Texas, and Nashville, Tenn., were visited by fires which started within 25 hours of each other and in which the fire-fighting period practically overlapped. Further coincidence was in the nature of the conflagrations, which had more in common than the date of their occurrence. They were all in mixed residence and business districts. In none was there any great congestion of buildings, in none was there a lack of water. The main cause of the spread of the fire in all was a high and violent wind, which in each case carried brands to near or far shingle roofs, this contributing more than any other factor to the spread of the fire. What should be noticed regarding them is that in each case a violation of a well known fire-protection truth contributed to the destruction. This was particularly so in the spread of the fire through communication to the shingle roofs, which had been long condemned by a number of fire-protection experts. The following tabulation gives the principal data of the three conflagrations:

	Paris, Tex.	Nashville, Tenn.	Augusta, Ga.
Length of fire, hours	10	4¾	10¾
Area burned, acres	264	64	160
Buildings destroyed.	1,440	648	682
Estimated loss	$11,000,000	$1,450,000	$4,250,000
Insurance loss	5,000,000	850,000	3,500,000

Lessons from the Augusta Fire.—In a report by the Southeastern Underwriters Association on the fire in Augusta, Ga., on March 22 and 23, which caused a loss of $4,250,000, the following are given as lessons learned from the conflagration:

The utter inability of a fire department to control a fire in a building of large area and fair height in which a fire can spread from cellar to roof in a period of time shorter than that in which the fire department can respond

and get into effective operation; the necessity for eliminating frame additions to brick buildings, protecting exterior and interior wall openings, enclosing vertical openings, and the necessity for proper construction of parapets, skylights and dormer windows; the need of an ample water supply at pressure giving effective hose streams under maximum requirements, or having all fire companies equipped with an ample supply of pumping engines; the danger arising from the storage of cotton in streets, which not only spreads the fire, but prevents engine companies from working at advantageous points; the inability, when the apparatus must come 100 miles by train, to get outside aid in time to be of material assistance, except in case of a second fire; the inability of a fireproof building, even if not occupied, to act as a fire barrier when not equipped throughout with properly protected windows; the danger of shingle roofs and the manner in which they spread fire beyond the ability of a fire department to handle, with ordinary wind blowing, even when a fair proportion of the buildings are brick and have non-combustible roofs and buildings are not congested; and the further fact that wide streets do not form a fire break when shingle-roof construction is present.

Hitherto very little attention has been given in Augusta to fire prevention either in the construction of buildings or the prevention of fires, and a recent attempt to create interest in these matters by the Georgia Fire Prevention Society was given a cold reception by citizens and city officials alike. The city formerly had an anti-shingle roof ordinance, but this was repealed after about two years and shingle-roof limits cut down to a comparatively small area. Just a few weeks before the fire the area in which shingle roofs were prohibited was further reduced. Enforcement of any of the laws has not been evident for many years, although conditions are better in this respect at present.

Fire Peril.—The magnitude of the fire peril may be gathered from a special report on fire hazards in factory buildings which has just been issued by the Joint Board of Sanitary Control in the Cloak, Suit and Skirt and the Dress and Waist Industries, New York City. According to this report it appears that these two industries are concentrated in the loft zone in Manhattan in 2,391 shops located in 928 buildings. These 928 buildings are but a part of the 16,000 loft buildings in the city. In these 928 buildings the workers in the two industries alone represented not less than 75,000 men and women and the total population of these 928 buildings was about 150,000 to 200,000. According to George M. Price, director of the Joint Board of Sanitary Control in these trades:

> A building may be considered safe which has sufficient exits in the form of stairways or proper fire escapes to allow all the persons working in the building to escape within three or five minutes, which is a reasonable time before the spread of fire may do harm to the workers. Out of the 928 buildings there were only 32 which could be regarded as reasonably safe, being provided with three or more stairways or a sufficient number of exits for the escape of all the persons working in them.

Progress in Fire Prevention.—There have been few events of signal importance during the year, although certain interesting manifestations of the growth of fire-prevention sentiment are in evidence. The following important organizations have passed resolutions at their annual conventions declaring for the principle of assessing the cost of extinguishing a preventable fire upon those disobeying fire-prevention orders: National Convention of Insurance Commissioners, National Association of Credit Men, National Paint, Oil and Varnish Association, International Association of Fire Engineers, Fire Marshals Association of North America, Pacific Coast Association of Fire Chiefs and National Wholesale Grocers' Association.

The creation of a committee on marine fire hazards by the National Fire Protection Association is a new development in the work, as nothing has ever been done in the direction of safeguarding shipping. Another item is a recent conference with the Federal Bureau of Education, the Association agreeing as a result to produce lectures on fire prevention to be distributed among the schools by the Bureau of Education. Another item which eventually may be significant is the creation by the Association of a committee on high-value districts. It is to be the work of this committee to make studies of conditions in individual cities and to recommend certain specific measures to reduce the conflagration hazards of

the mercantile districts. Throughout the United States the system recently installed in New York, whereby routine fire-inspection duties are performed by members of the uniformed fire fighting force, has been extended with excellent results in the field of fire prevention and without detriment to the efficiency of the uniformed force in the field of fire extinguishment. The New York Bureau of Fire Prevention has completed its revision and redrafting of its office and inspection forms and these forms have been adopted by many other cities.

The New York Fire Department has made studies and prepared recommendations for the installation of automatic sprinklers acting by the pressure of the water in street mains instead of by means of roof tanks and house pumps. Only the preliminary work has been completed. There is a movement to make privately owned auxiliary fire-alarm systems a part of the regular municipal fire-alarm system with a view to increasing their efficiency and reducing their cost.

Fire Prevention Day.—During the year the National Fire Protection Association reached an agreement with the National Safety Council to cooperate with that body in securing the observance of Fire Prevention Day on Oct. 9 in all important cities throughout the nation. The plan followed was for the local board of trade or chamber of commerce to take the initiative in conducting this observance, the association to furnish literature and interest local members in assisting in the celebration.

Centralization of Fire-Fighting Force.—Commissioner Adamson of the New York City Fire Department has introduced experimentally a plan for the centralization of the fire-fighting force. The fire-fighting unit is the battalion, which is made up of the apparatus and complement of men that respond to an alarm. In almost all American cities each company of the battalion is housed in separate quarters in order that the companies may be well distributed over the entire battalion district. With the motorization of the New York Department, the need for this wide distribution has disappeared and Commissioner Adamson is planning to house an entire battalion in one large apparatus house. This house will have double entrances on two adjoining streets, thus permitting four companies to leave the house simultaneously. The resulting saving in sites, maintenance and number of officers will be considerable.

National Fire Protection Association.—The twentieth annual meeting of the National Fire Protection Association was held in Chicago, May 9-11. The Underwriters' Laboratories were opened to members of the Association for inspection visits during the convention week. The programme of the convention included the report of the executive committee, and reports of the committees on public information, state fire prevention associations, automatic sprinklers, and standardization of pipe and fittings. (See also "Progress in Fire Prevention," *supra*.)

POLICE

Chicago Crime Commission.—A new Crime Commission for Chicago was appointed on Oct. 5, 1915, composed of leading authorities on law, crime and social welfare, to make a searching investigation of criminal practice and procedure. The commission is considering especially an improved system of criminal statistics; methods and practices in police and criminal courts; methods in vogue in the offices of the city prosecutor and the state attorney; necessary changes in criminal law and procedure and drafts of such proposed changes; operation of the parole and probation systems; creation of a consolidated court system for Chicago; and improved methods of electing judges. The scope of the work entrusted to the commission is large enough to embrace practically everything pertaining to the administration of criminal justice in Chicago, including even the matter of electing judges, although efficiency in administering criminal law in the courts of Chicago necessarily involves reconstruction and consolidation of numerous local departmental agencies which, in

turn, will depend upon constitutional changes.

The Black Hand in New York.— While serving as head of the New York Detective Bureau in 1908, Arthur Woods, now Commissioner of Police, conducted negotiations with the Department of State through which the Italian Government made arrangements to turn over the penal certificates of malefactors of that nationality to agents of the New York Police Department. According to the *Outlook*, the dismissal of General Bingham and the resignation of Mr. Woods in 1909, with the subsequent suppression of the more than 700 penal certificates, halted the work of exterminating Black Hand crime. The evil order grew and thrived. In October, 1910, during Mayor Gaynor's administration, William J. Flynn, Chief of the Secret Service of the Treasury Department, who had brought about the sentence of eight of the most important members of the Black Hand to a total of 150 years' imprisonment by way of the Federal courts, was made a deputy commissioner of police. He at once began a vigorous crusade against the Black Hand, but as he began to get results he was transferred to another branch of the detective service and resigned. Mr. Woods became commissioner early in 1914; and he has since given particular attention to Black Hand crime. So successful has been the policy adopted of close surveillance and quick arrest of these malefactors on the commission of any crime, no matter how trivial, with the detention of witnesses and the skillful working up of evidence, that in two years the *omerta*, or conspiracy of silence, once the most effective factor in preventing convictions in Italian cases, has practically disappeared from the courts. Respectable Italians now carry complaints of the Black Hand to the police of their own accord, and there is comparative peace in the Italian settlements. The same conditions exist in these settlements elsewhere throughout the country, not only because hundreds of the more active of the Black Handers are now in prison, but because the situation in other cities has generally been controlled by leaders in New York. The police measure of Black Hand crime, according to the *Outlook*, is in the comparative number of arrests for bomb-throwing. There were 151 arrests for this crime in 1913, 65 in 1914, 45 in 1915. Up to April, 1916, there were but three arrests for bomb-throwing in New York. The decrease in such crimes as murder, arson, blackmail, kidnapping, and extortion has been approximately on the same scale.

Police Telephones in New York.— One of the most efficient results achieved under Commissioner Woods has been the perfection and extension of the police telephone system. Flash lights are now attached to electric-light posts on the street curb and have five lenses. They may be seen in the daytime at a distance of 600 ft., and at night nearly 2,000 ft. Attached to the same post is the iron box containing the telephone equipment. By turning a switch in the station-house, the lieutenant on the desk flashes the light on any post at intervals of four seconds. The light continues to flash until the officer wanted sees the call and goes to the telephone box and removes the receiver from the hook. A citizen call-button is also attached to the box, by means of which he may call an officer by merely pressing the button and lighting the lamp overhead, which throws a steady ray while the button is being pressed.

The alarms at ferry houses, bridges and railroad terminals (flash light and telephone) play a most important part in the interception of criminals, and the recovery of stolen property. In particular the apprehension of automobile thieves and of persons attempting to avoid arrest by trying to leave the jurisdiction of the city, is made possible, although the fugitive may have a start of minutes and sometimes of hours on his pursuers.

In the suburban sections of the city where the police stations are far apart, there has been established a system of police booths. In these officers provided with a bicycle or motorcycle are stationed at all times. They have direct telephone connection with the station house, also with the public exchange service. By these means, a large number of patrolmen otherwise required to cover that

great amount of territory are released, and the resident is provided with means of calling an officer even more quickly than if a thousand patrolmen were walking posts.

Efficiency Records for Policemen.—Commissioner Woods has introduced experimentally in several precincts an elaborate amplification of the efficiency record system for policemen devised by Chief Corriston of Minneapolis several years ago. The New York system provides for a tabulated number of merit marks for each act of police work successfully performed, which vary with the nature of the post to which the policeman is assigned in order that the man assigned to a busy post may not have an unfair advantage. A similar system of demerit marks also has been tabulated. Provision will be made for considering these efficiency records in promotion examinations, and for giving additional time off each month to the most efficient policeman in each precinct and an additional week of annual vacation to the most efficient policemen on the force.

Minneapolis.—In Minneapolis a survey of the police department is being made under the auspices of F. S. Staley of the Minneapolis Civic and Commerce Association.

International Association of Chiefs of Police.—The annual convention of the International Association of Chiefs of Police was held in Newark, N. J., on June 6. The following officers were elected: president, Michael T. Long, of Newark, N. J.; secretary, C. G. Kizer, of Norfolk, Va.; treasurer, Frederick E. Roach, of Jacksonville, Fla.; sergeant-at-arms, Lona B. Day, of Scranton, Pa. The 1917 convention will be held in Kansas City.

Vice Investigations and the Social Evil.—The following reports of vice investigations were made in 1915: Springfield, Ill., Shreveport, La., Rockland County, N. Y., Lancaster, Pa., Lexington and Louisville, Ky., Toronto, Canada, Richmond, Va., and the state of Maryland, the two latter not printed. The following reports have been made in 1916: State of Illinois, New York City, Bridgeport, Conn., and Paducah, Ky. A complete list of reports made to March, 1916, has been printed in the *Bulletin* of the American Social Hygiene Association.

As a result of the work of the Baltimore Society for the Suppression of Vice and the Vice Commission, the former reports the following points gained:

(1) All houses of public prostitution in Baltimore are now closed. (2) The inmates have been offered an opportunity to enter an honest life, and some have accepted. (3) Several hundred young girls are saved from lives of shame every year. (4) The closing of assignation houses. (5) Lessened amount of street-walking. (6) Improved conditions in hotels. (7) Diminished number of assaults on women. (8) The practical elimination of the white-slave traffic. (9) A diminution of social diseases and consequent lessening of suffering among innocent women and children which must follow. (10) Improvement in the morale of the police force. (11) Elimination of the exploitation of vicious women as a matter of commerce. (12) A step toward the creation of a healthy public sentiment against the toleration of segregation of social vice. (13) Encouragement given to officials in the performance of their duties. (14) The removal of the public disgrace of vice districts previously tolerated and supervised by the authorities. (15) Baltimore, from a moral standpoint, made one of the cleanest cities in the United States.

The report of the Vice Commission has not been published, although some of its findings and conclusions have been summarized by W. D. Lane in *The Survey*. (See also XV, *Social Hygiene*.)

NUISANCES

Validity of Smoke Regulation.—The U. S. Supreme Court has handed down an important decision involving the validity of the Des Moines smoke ordinance (Northwestern Laundry *v.* Des Moines, 239 U. S. 486). The plaintiff sued to enjoin enforcement of an ordinance adopted by defendant city, which declared the emission of dense smoke in portions of the city to be a public nuisance and prohibited the same. To that end the ordinance authorized the appointment of a smoke inspector, and otherwise dealt with the subject with a view to effecting the prohibi-

tive purpose declared. It was insisted by the plaintiff that the ordinance was void because its standard of efficiency required the remodeling of many existing furnaces, because licenses for such remodeling were required, because the smoke inspector and the smoke-abatement commission were given unrestrained discretion to prescribe equipment requirements, and because the ordinance did not operate uniformly throughout the city. All these and numerous minor objections against the validity of the ordinance were overruled by the Supreme Court. The Court said:

> So far as the Federal Constitution is concerned, we have no doubt the state may by itself or through authorized municipalities declare the emission of dense smoke in cities or populous neighborhoods a nuisance and subject to restraint as such; and that the harshness of such legislation, or its effect upon business interests, short of a merely arbitrary enactment, is not valid constitutional objection. Nor is there any valid Federal constitutional objection in the fact that the regulation may require the discontinuance of the use of property or subject the occupant to large expense in complying with the terms of the law or ordinance. Recent cases in this Court are Reinman *v.* Little Rock, 237 U. S. 171; Chicago & Alton Railroad Co. *v.* Tranberger, 238 U. S. 67; Hadacheck *v.* Sebastian, decided Dec. 20, 1915 [see *City Planning, supra*].
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> That such emission of smoke is within the regulatory power of the state has been often affirmed by state courts. Harmon *v.* Chicago (110 Ill. 400); Bowers *v.* Indianapolis (169 Ind. 105); People *v.* Lewis (86 Mich. 273); St. Paul *v.* Haugbro (93 Minn. 59); State *v.* Tower (185 Mo. 79); Rochester *v.* Macauley-Fien Milling Co. (199 N. Y. 207). And such appears to be the law in Iowa *v.* Pintsch Compressing Co., 140 Ia. 429.

Discussing the allegation that the Des Moines ordinance was in excess of the legislative grant, the Supreme Court pointed out the reasonableness of the ordinance in providing that the smoke inspector "must be qualified by training and experience to understand the theory and practice of smoke inspection," and that in addition he "has the benefit of counsel of the smoke-abatement commission, consisting of five members . . . at least one of whom must have had experience in the installation and conduct of power and heating plants."

Under the Des Moines ordinance, smoke density is limited to 3 on the Ringelmann chart, and the time limit is six minutes in any one hour. Fines of not less than $10 or more than $100 are imposed for each violation of the ordinance. A smoke-abatement commission composed of five members acts as adviser to the inspector in the conduct of the department. No new plans for producing power and heat nor any new chimney furnace or fireplace is allowed in the city until plans and specifications have been approved by the inspector and a necessary permit issued by him. The same rule applies to alterations of existing plants.

Pittsburgh.—A handbook has been published by the Bureau of Smoke Regulation in the Pittsburgh Department of Health to answer inquirers as well as to visualize, by means of photographs, some of the changes that prove Pittsburgh is entitled to a new name. Smoke abatement, under the present administration, according to the latest report, is not only the fulfilment of a promise, but also marks a distinct epoch in the city's civic and industrial history. The results for the year covered have not been equalled there or anywhere else within the same space of time. No other city has been confronted with a smoke problem of such magnitude or has encountered similar difficulties in the effort to solve it. The three rivers, the deep valleys, the frequency of high humidity and low wind velocity with resultant fogs, are purely local conditions that must be reckoned with in any consideration of the smoke nuisance and its abolishment. The extent of the mill district, the great number of stacks in restricted areas, the immense quantity of smoke-producing fuels consumed, the characteristics of the high volatile coal natural to the district, and the variety of boiler and metallurgical furnaces, constitute sources of smoke within the city and its borders, with which there is no comparison in America. The handbook says:

> It is safe to say that the "production and emission of smoke" in Pittsburgh has been abated fully seventy-five (75) per cent. when compared with what did exist and would be the condition were there no regulatory laws and effective enforcement. This, too, with business activity greater than ever before and with coal consumption increased to tax the capacity of the mines and furnaces.

Louisville.—Authorization for the employment of an engineer expert on combustion to supervise a preliminary survey of Louisville, Ky., for the elimination of the smoke nuisance has been voted by the Smoke Abatement League.

New York.—In 1907 an order was adopted by the Public Service Commission for the first district of New York and issued to the N. Y., N. H. & H. R. R. Co.,

> that said company cease and desist from further suffering or permitting in any manner the emission of black smoke from the stacks of the engines in use on the lines of said company, at any and all times while such engine shall be standing in or passing through the Harlem River terminal yard, and that said company cover all soft-coal fires in said yard, whether standing still or passing through said yard with coke and continually to feed and replenish same with coke during the time said engines shall remain in said yard; and further that said company discontinue the use of the roundhouse in said yard and of the tracks in and adjacent to the same for the storage of engines under same.

In February, 1908, an order was served on the N. Y. C. R. R. Co. to desist from the use of soft coal on any engines used by it on its Putnam Division, while within the corporate limits of New York City. In March, 1908, a further order was served on the N. Y. C. R. R. Co., that every engine owned or controlled by it and operated in a northerly direction on the line lying west of Riverside Drive and west of the Boulevard Lafayette should be started on its northerly run with a clean anthracite coal fire or fire produced by other smokeless fuel, or with devices preventing the emission of black smoke, if such be discovered. That every such engine should in addition carry an available supply of hard coal, etc., sufficient to carry the engine through the city of New York, this amount of hard coal or other smokeless fuel to be never less than one ton for each engine, or, in case of liquid fuel, of such an amount as would be sufficient to carry the engine beyond the northerly limits of the city of New York, in addition to the amount in the fire box at the beginning of the trip.

In July, 1916, an order was issued to the L. I. R. R. Co. to the effect that it shall operate no steam locomotive through the tunnels on its Atlantic Avenue Division, except between the hours of 12 midnight and 6:00 a. m. This order is possibly subject to further amendment after further hearings.

The above orders relative to the smoke nuisance on the railroads entering New York have largely eliminated the complaints due to these causes. In the case of the N. Y., N. H. & H. R. R. Co., the Harlem River yard has since been electrified and all passenger business of this company and over 60 per cent. of the freight business is now handled by the electric service.

Minneapolis.—In 1913 the Minneapolis Civic and Commerce Association employed a smoke inspector, paying his salary out of the Association funds. During his activity, the reduction in the smoke nuisance was very evident. In the spring of 1914, however, the Association requested the City Council to assume the responsibility of the employment of this inspector, believing that he should properly be upon the city payroll. After considerable agitation, the Council decided not only not to employ the inspector, but also to abolish altogether the office of smoke inspector. The Association's committee has nevertheless continued its activities. Meetings have been held with the smoke inspectors of the railroads entering the city, in an endeavor to secure their coöperation in eliminating the emission of smoke from railroad engines. On the recommendations of the committee, a course for the instruction of firemen in the proper care and operation of heating apparatus has been inaugurated at the Dunwoody Industrial Institute, and during the spring of 1916 the Association employed a checker to investigate industrial plants and railroad yards which were emitting dense smoke.

Each year for three successive years the committee had recommended to and urged upon the City Council the creation of a department of smoke inspection, but was unsuccessful until 1916, when an examination for smoke inspector was held and the successful candidate assumed the duties of the office on May 1.

MUNICIPAL ORGANIZATIONS

National Municipal League.—The twenty-second annual meeting of the National Municipal League was held in Springfield, Mass., on November 23-25, in conjunction with the City Managers' Association, Training School for Public Service, Massachusetts Federation of City-Planning Boards, and Massachusetts and Western New England Chambers of Commerce. There were also sessions of the Civic Secretaries' Committee and the Intercollegiate Civic Division of the National Municipal League, and a conference of officials of bureaus of municipal research.

Among the questions discussed at the League's meeting were: political parties in city government; state politics in municipal legislation; municipal non-partisanship; coördination of civic forces; extension of municipal activities and municipal expenditures; private and public welfare activities. One session was devoted to a discussion of the practical operation of various forms of city government; another session held in conjunction with the Massachusetts Federation of City-Planning Boards considered sundry problems of city planning; another held in connection with the City Managers' Association discussed the most important accomplishments of cities during 1916. The address of President Lawson Purdy dealt with "Some Advanced Municipal Steps" and the annual review of Secretary Woodruff discussed "Municipal Preparedness." Formal reports were received from the committees on new sources of revenue, the relation of the city to its food supply, municipal courts, franchises, civic bibliography, and municipal reference libraries.

Lawson Purdy, George Burnham, Jr., and Clinton Rogers Woodruff were reëlected president, treasurer, and secretary, respectively. The following vice-presidents were reëlected: John Stewart Bryan, Richmond, Va.; Charles Richardson, Philadelphia; Miss Jane Addams, Chicago; Richard S. Childs, New York; Oliver McClintock, Pittsburgh; Walter L. Fisher, Chicago; Frank J. Goodnow, Baltimore; A. Lawrence Lowell, Cambridge; George McAneny, New York; J. Horace McFarland, Harrisburg; Robert Treat Paine, Boston; L. S. Rowe, Philadelphia; Meyer Lissner, Los Angeles, Cal.; Dudley Tibbits, Troy, New York.

City Planning, by John Nolen, and *Town Planning for Rural and Industrial Communities*, by Charles Sumner Bird, Jr., are the latest volumes to be added to the National Municipal League Series (New York, D. Appleton & Co.).

The Intercollegiate Civic Division of the National Municipal League held its annual meeting at the New York City Club on April 27-28. Arthur E. Woods, of the University of Pennsylvania, is secretary of the Division. A national Conference for Governmental Research was organized at Springfield with L. D. Upson, Detroit, president, and C. O. Dustin, Springfield, Mass., secretary.

City Managers' Association.—The third conference of the City Managers' Association was held in Springfield, Mass., on November 21-23, in conjunction with the National Municipal League. Thirty city managers were present, with Henry M. Waite of Dayton, Ohio, as president, and Ossian E. Carr of Niagara Falls, N. Y., as secretary. The meeting was largely taken up with a discussion of technical questions, although the following subjects also were discussed: possibilities of success of the city manager where the commission is dominated by politics; training of understudies for the city manager in cities of under 25,000; legal difficulties in the establishment of new charters. Among the technical questions were: budgets; best method of keeping cost records; publicity of bids in city purchasing. Ossian C. Carr, Niagara Falls, N. Y., was elected president for the ensuing year, and W. L. Miller, St. Augustine, Fla., reëlected secretary.

The American Civic Association held its annual meeting in Washington in December. J. Horace McFarland of Harrisburg was reëlected president, Richard B. Watrous, Union Trust Building, Washington, D. C., secretary, and William B. Howland, New York, treasurer.

The American Society of Municipal Improvements met in Newark, N. J., on Oct. 10-13. The meeting was generally considered one of the most effective in the history of the organization. The sessions were mainly occupied with a discussion of technical questions and the trips taken were to important improvements in or near Newark. Norman S. Sprague of Pittsburgh was elected president, and Charles Carroll Brown, *Municipal Engineering*, Chicago, was reëlected secretary.

The League of American Municipalities held its annual meeting in Newark, N. J., on Sept. 7-9. Martin Behrman of New Orleans was reelected president, and Robert E. Lee of Baltimore, secretary.

Other Organizations.—The first National Conference on Community Centers was held in New York on April 19-22. It continues as a permanent organization with H. A. Lipsky, chairman of the Chicago School Board's committee on community centers, as president. The conference was attended by delegates from 68 cities, and was the scene of debates more heated than are usual at social-service conferences. The secretary is John Collier, 70 Fifth Avenue, New York.

The third National Open Forum Conference was held in Buffalo on May 7-9, with delegates present from more than 100 forums. Miss Mabel B. Ury, 9 Myrtle Street, Boston, is secretary.

The second annual conference of the Association of Urban Universities was held in Cincinnati, Nov. 15-17, 1915; and the third at Philadelphia, Nov. 16-18, 1916. The proceedings are published in book form. E. A. Fitzpatrick, Madison, Wisconsin, is secretary.

The American City Bureau Summer School for Commercial Secretaries was held at Ithaca, N. Y., July 24-Aug. 5, with 49 in attendance.

MISCELLANEOUS

General Statistics of Cities.—Early in 1916 the Bureau of the Census issued its annual volume of "General Statistics of Cities" covering the departmental year of each municipality closing between July 1, 1914, and June 30, 1915, inclusive. The field covered comprises governmental organization, police departments, liquor traffic, and municipally owned water-supply systems in cities having over 30,000 inhabitants.

Of the 204 cities covered by the report, 81 had commission government, 95 others had single-chambered councils, and 28 had two branches of the council. Of the cities with single-chambered councils, 11 elected all the members at large, and 40 elected some of the members at large. In the cities with two houses, six elected all the members of the upper council at large, and three elected some of the members at large. The statistics as to mayors and other executive officers cover only the length of term and salaries.

In the police data, wide variations are shown in the number of police in proportion to population and in the ratio of officers to the total number of police. Cleveland, Pittsburgh, and most of the southern cities have a relatively small police force, but Washington has nearly twice the number in New Orleans. The proportion of officers ranges from 5.1 per cent. in Grand Rapids, Mich., to 22.8 per cent. in Oakland, Cal.

The liquor traffic was prohibited in 35 of the 204 cities, which included 6.7 per cent. of the aggregate population of the cities covered. In all the cities included the number of retail liquor dealers decreased 16.6 per cent. from 1905 to 1915, and in a considerable number of cities there has been a higher rate of decrease. The number of dealers in proportion to population ranged from 1 to 194 in East St. Louis, to 1 to 5,286 in Colorado Springs.

Municipally owned water-supply systems were reported by 155 of the 204 cities. Seventy-three employed purification processes. The average amount of water supplied was 139 gals. *per capita* per day. (See also XI, *Water Supply;* and XXI, *Civil Engineering.*)

City and County Consolidation.—Early in 1916 the City and County

Government Association of Alameda County, California, was formed, fostered by the Taxpayers' Association. The executive committee of this new organization has prepared a federated charter for Alameda County and its cities (including Alameda, Berkeley and Oakland) under a system of boroughs, which it is believed can be worked out under Section 8½ of the constitution of California. Borough boards will have legislative powers only, just the reverse of the situation under the charter of Greater New York. They will have local autonomy in certain police and health regulations, and the cities, which will be called boroughs if the charter is adopted, will maintain their present identity and independence, and have power to fix their own tax rates for borough purposes.

The estimated saving that can be brought about by federation under the plan proposed will run close to $1,000,000 annually. The total budgets of the county and the various cities within Alameda County now approximate $10,000,000 annually. This does not take into consideration the increased efficiency that will come under a proper business management of the county and municipal governments. It is proposed to have a county manager appointed by the council managers for the boroughs, and an elective mayor.

The National Municipal League's Committee considering the problem of city and county consolidation (H. S. Gilbertson, New York, chairman) has reported that aside from the economies of a single local government as opposed to two or more, it seems essential that the future development of large centers of population should not be hampered by conflicting policies of a double or multiple system of local governments. Perils which continually threaten the population of urban communities, such as fire, crime and contagious diseases, constitute unified administrative problems which are coextensive with congested areas. The control of these perils should be a unified one, and too much reliance should not be placed upon a spirit of coöperation between different units of local government.

Socialist Mayor in Milwaukee.—Milwaukee has chosen another Socialist as its mayor, Daniel W. Hoan, formerly city attorney. This result was due not only to the continuous growth of the Socialist vote, but to the fact that the non-partisan administration had failed to impress itself favorably upon the people of the city. In 1900 the Socialist candidate for mayor received 2,984 votes. Since that time the Socialist vote for this office has increased at every election, until at the one in April, 1916, Mr. Hoan received 33,863 votes, a majority of 1,700. The Socialists elected less than one-third of the aldermen and failed to elect their candidates for treasurer and comptroller. The Socialist vote for these two offices, however, was larger than at any time in the history of the city. The Socialists elected nine ward aldermen (they formerly had eight).

Los Angeles the Largest City Territorially.—To enable suburban cities to avail themselves of city water, Los Angeles has become, through its vote at a special election, the first city in the United States in point of area. The recent completion of the Los Angeles aqueduct brings mountain water 250 miles in sufficient quantity to supply a city of 2,000,000 inhabitants. As the aqueduct water may not be sold to those living outside of the city limits, a large amount of outlying territory has been voted into the corporate limits. Los Angeles was second only to New York previously, but with the annexation of the Westgate district, containing 48.67 sq. miles, and of the Occidental district, it now has a total area of 337.92 sq. miles, as compared with New York City's 314.75 sq. miles. Chicago is third with 198 sq. miles, and Philadelphia fourth with 129 sq. miles.

A Modern Municipal Court Act.—The draft of a model municipal-court act has been completed by a special committee of which Chief Justice Olson of the Chicago Municipal Court is chairman. The drafting has been done by the American Judicature Society, the membership of which embraces the National Municipal League's committee. The model act is published by the Society in two bulletins. The first is devoted to the

selection and retirement of judges. It contains a keen analysis of existing methods and proposes constructive reforms of a most suggestive and valuable sort. The act proper appears in the second. While in form it is adapted to the largest cities, which embody the most difficult problems, it is adaptable with slight modification to the needs of cities of 100,000 or more.

The drafting of this act represents a large share of the research and constructive work of the Society over a period exceeding two years. The act was submitted to the advisory council of the Society as a first draft two years ago. Criticisms from judges, representative lawyers and political scientists in many cities were secured, and the present publications represent a revision embodying the most mature experience and thought on the subject.

The Recall in Cities.—An effort to recall the mayor of San Francisco during the year failed, as did a similar effort in Atlanta, Ga. A proposal to recall the entire commission in Sandusky, Ohio, came to naught. An effort to recall the commissioner of health in Oakland, Cal., failed. In Nashville, Tenn., the terms of an ouster law were utilized to get rid of unsatisfactory officials instead of the recall (see *infra*). The attempt to recall one of the supervisors of Alameda County, California, spent itself in a futile struggle over the commission. "Some Recent Uses of the Recall" was discussed by F. S. Fitzpatrick in the July issue of the *National Municipal Review*.

Removals of Municipal Officials in Tennessee. — Under the Tennessee ouster law Mayor Howse of Nashville has been removed from office, and the Supreme Court, after sustaining the action of the lower court, temporarily disqualified Howse politically by the construction given by it to the provisions of the law. It held that any acts of misfeasance or malfeasance, or acts indicating official unworthiness occurring even during a former term are grounds of ouster.

The Supreme Court also decided against Mayor E. H. Crump and Commissioner R. A. Utley of Memphis, who were ousted under the same law, the charge against them being failure to enforce the prohibition laws. They were ousted on Nov. 3, 1915, by chancery decree, on pleas of guilty entered "to expedite an appeal." The cases of Crump and Utley differed from the Nashville cases, the two defendants having been reëlected previous to the ouster proceedings for new terms beginning January 1, 1916. The Supreme Court sustained their ouster from office, but held that the proceedings did not apply to their new terms.

Snow Removal.—The subject of snow removal has received more attention during the past two or three years than ever before, and a conference on the subject was held in New York on March 8 under the general auspices of the divisions of highway engineers and of municipal engineers of the National Highway Association, the Society of Street Cleaning and Refuse Disposal of the United States and Canada, the Automobile Club of America, the Citizens' Street-Traffic Committee of Greater New York and the graduate class in highway engineering of Columbia University. About 125 were in attendance from Boston, Hartford, Cleveland, Philadelphia, and other cities.

Municipal Reference Libraries.—A combined committee of the National Municipal League and of the Special Libraries Association is working to bring about the closer affiliation of the various municipal reference libraries with the state and Federal departments. Dr. Charles C. Williamson, the municipal reference librarian of New York, is chairman of the committee.

New Municipal Publications.—Among the new municipal publications established during the year are: *The Public Service*, by the Society for the Promotion of Training for Public Service; *Minnesota Municipalities*, by the League of Minnesota Municipalities; *Washington Municipalities*, by the League of Washington Municipalities; *Civic Affairs*, by the Civic League of Cleveland; *Bulletin of the Brooklyn Civic League; The Town*, by the Woman's Civic League, Baltimore; *Municipal Bulletin*, Asheville, N. C.; *City Bulletin*, Columbus, Ohio, by the city; *City Journal*, Toledo, Ohio.

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FINANCIAL STATISTICS OF CITIES OF POPULATION ABOVE 50,000

(In Thousands of Dollars)

The figures in this table are courteously supplied by the Bureau of the Census from the report on "Financial Statistics of Cities" for 1916 in press at the end of the year. They relate to the fiscal year ending June 30, 1916, or to the first fiscal period prior thereto.

	Population, 1910	Assessed Valuation of Property	Total Tax Levy for Municipal Purposes	Total Revenue Receipts	Government Cost Payments			Net Debt
					For Expenses and Interest	For Outlays	Total	
Akron, Ohio	69,067	132,614	1,541	2,395	1,663	1,471	3,134	7,597
Albany, N. Y.	100,253	121,377	2,195	3,246	2,377	1,905	4,283	6,950
Allentown, Pa.	51,913	47,198	641	918	671	423	1,094	1,070
Altoona, Pa.	52,127	27,240	566	967	684	249	934	1,916
Atlanta, Ga.	154,839	182,812	2,302	3,818	2,928	859	3,787	4,728
Atlantic City, N. J.	46,150	95,454	1,344	2,349	1,965	518	2,483	7,346
Baltimore, Md.	558,485	818,102	10,084	16,594	14,532	7,263	21,795	67,063
Bayonne, N. J.	55,545	61,309	910	1,697	1,544	107	1,651	2,498
Berkeley, Cal.	40,434	43,097	843	1,406	1,034	569	1,603	1,736
Binghamton, N. Y.	48,443	37,803	931	1,246	918	792	1,710	1,878
Birmingham, Ala.	132,685	93,531	935	2,223	1,950	264	2,214	6,812
Boston, Mass.	670,585	1,565,661	25,384	36,690	30,572	4,753	35,325	85,579
Bridgeport, Conn.	102,054	141,417	2,614	2,524	1,953	1,179	3,132	3,701
Brockton, Mass.	56,878	54,389	1,101	1,693	1,336	335	1,671	3,085
Buffalo, N. Y.	423,715	457,105	13,366	16,458	13,507	4,272	17,780	34,007
Cambridge, Mass.	104,839	130,110	2,663	3,655	2,975	627	3,603	6,928
Camden, N. J.	94,538	75,233	972	1,887	1,770	420	2,191	4,810
Canton, Ohio	50,217	82,181	808	1,130	898	1,573	2,472	3,841
Charleston, S. C.	58,833	20,787	800	1,087	973	199	1,172	4,106
Chattanooga, Tenn.	44,604	35,728	589	874	803	190	994	3,498
Chicago, Ill.	2,185,283	1,041,770	53,905	81,051	56,967	26,127	83,095	69,817
Cincinnati, Ohio	363,591	594,397	8,948	15,098	13,192	4,629	17,821	62,884
Cleveland, Ohio	560,663	891,331	13,275	19,556	15,966	12,654	28,621	62,656
Columbus, Ohio	181,511	282,151	2,897	5,219	4,450	1,733	6,183	10,293
Covington, Ky.	53,270	30,185	528	938	815	123	938	2,542
Dallas, Tex.	92,104	119,102	2,262	3,616	2,224	1,849	4,074	5,991
Dayton, Ohio	116,577	171,481	1,777	2,787	2,179	935	3,114	6,641
Denver, Col.	213,381	358,365	5,090	6,442	5,085	673	5,758	771
Des Moines, Ia.	86,368	35,092	2,004	2,151	1,763	361	2,125	3,669
Detroit, Mich.	465,766	731,991	14,562	21,442	13,368	9,934	23,303	20,202
Duluth, Minn.	78,466	79,096	1,676	3,026	2,007	1,100	3,108	6,748
East St. Louis, Ill.	58,547	12,541	735	1,169	936	146	1,083	1,436
Elizabeth, N. J.	73,409	69,718	937	1,629	1,213	296	1,510	3,000
El Paso, Texas	39,279	46,707	854	1,403	1,028	581	1,610	3,231
Erie, Pa.	66,525	50,086	867	1,403	1,039	551	1,590	1,250
Evansville, Ind.	69,647	44,168	871	1,341	992	449	1,441	1,916
Fall River, Mass.	119,295	107,153	2,188	3,002	2,359	893	3,253	5,307
Flint, Mich.	38,550	37,166	551	1,042	735	597	1,333	1,760
Fort Wayne, Ind.	63,933	40,476	858	1,760	1,140	590	1,731	939
Fort Worth, Tex.	73,312	67,046	1,273	1,970	1,390	364	1,755	5,245
Grand Rapids, Mich.	112,571	163,026	1,979	3,191	2,253	929	3,183	3,901
Harrisburg, Pa.	64,186	50,013	910	1,331	1,022	464	1,487	2,836
Hartford, Conn.	98,915	180,824	2,924	3,875	2,950	1,734	4,684	10,007
Hoboken, N. J.	70,324	74,157	1,060	1,808	1,646	323	1,970	3,376
Holyoke, Mass.	57,730	65,204	1,073	2,059	1,651	501	2,153	3,207
Houston, Tex.	78,800	135,805	2,444	3,358	2,234	1,561	3,796	11,731
Indianapolis, Ind.	233,650	243,698	4,330	6,801	5,022	2,647	7,669	6,025
Jacksonville, Fla.	57,699	59,723	760	1,958	1,574	835	2,409	3,840
Jersey City, N. J.	267,779	300,642	3,814	7,060	5,766	1,069	6,835	19,732
Johnstown, Pa.	55,482	48,733	649	868	696	392	1,089	733
Kansas City, Kan.	82,331	93,022	1,364	2,267	1,694	1,039	2,733	6,069
Kansas City, Mo.	248,381	206,753	5,267	9,670	6,501	3,192	9,693	10,487
Lancaster, Pa.	47,227	29,414	451	637	563	105	668	1,564
Lawrence, Mass.	85,892	82,769	1,319	1,789	1,546	1,217	2,763	3,367
Little Rock, Ark.	45,941	34,116	420	894	648	97	745	871
Los Angeles, Cal.	319,198	418,898	13,107	23,112	16,329	9,579	25,909	47,014
Louisville, Ky.	223,928	213,136	3,937	5,992	4,300	2,198	6,499	12,829
Lowell, Mass.	106,294	93,588	1,710	2,426	1,991	333	2,324	2,735
Lynn, Mass.	89,336	91,840	1,748	2,613	2,012	699	2,711	4,319
Malden, Mass.	44,404	42,925	863	1,168	982	186	1,168	1,372
Manchester, N.H.	70,063	85,217	1,077	1,433	1,162	324	1,487	1,317

FINANCIAL STATISTICS OF CITIES OF POPULATION ABOVE 50,000—*Continued*

(In Thousands of Dollars)

	Population, 1910	Assessed Valuation of Property	Total Tax Levy for Municipal Purposes	Total Revenue Receipts	Government Cost Payments			Net Debt
					For Expenses and Interest	For Outlays	Total	
Memphis, Tenn.	131,105	117,914	1,863	3,179	2,837	967	3,804	12,071
Milwaukee, Wis.	373,857	535,831	8,859	14,375	9,321	5,302	14,624	15,236
Minneapolis, Minn.	301,408	279,372	7,303	9,971	7,879	3,863	11,743	18,972
Mobile, Ala.	51,521	33,360	366	863	761	112	873	3,045
Nashville, Tenn.	110,364	75,927	1,138	2,350	1,937	752	2,690	7,737
Newark, N. J.	347,469	441,989	8,783	14,659	12,040	4,459	16,499	38,264
New Bedford, Mass.	96,652	111,392	2,259	3,265	2,386	845	3,231	8,074
New Britain, Conn.	43,916	45,551	732	1,099	796	350	1,147	3,215
New Haven, Conn.	133,605	161,750	3,201	3,087	2,559	889	3,449	4,499
New Orleans, La.	339,075	243,237	5,402	8,585	7,593	2,958	10,551	43,645
New York, N. Y.	4,766,883	9,230,869	164,417	223,854	193,043	30,634	223,677	951,060
Norfolk, Va.	67,452	83,268	1,324	2,086	1,842	282	2,124	8,098
Oakland, Cal.	150,174	142,871	3,310	5,546	3,909	1,588	5,497	9,649
Oklahoma City, Okla.	64,205	64,731	1,003	1,537	1,165	63	1,228	4,619
Omaha, Neb.	124,096	44,607	3,316	4,408	3,444	862	4,307	17,420
Passaic, N. J.	54,773	49,508	683	1,130	920	368	1,289	2,723
Paterson, N. J.	125,600	111,406	1,570	2,478	1,927	809	2,736	5,083
Pawtucket, R. I.	51,622	56,792	866	1,389	1,229	493	1,723	5,299
Peoria, Ill.	66,950	24,081	1,157	1,520	1,182	529	1,711	892
Philadelphia, Pa.	1,549,008	2,315,319	27,675	45,858	39,244	13,489	52,734	103,787
Pittsburgh, Pa.	533,905	782,563	16,403	21,470	17,096	7,081	24,178	54,268
Portland, Me.	58,571	71,843	1,219	1,912	1,600	407	2,008	6,926
Portland, Ore.	207,214	315,119	4,284	8,554	6,237	2,525	8,763	16,517
Providence, R. I.	224,326	349,375	4,802	6,617	5,417	1,678	7,096	14,093
Pueblo, Col.	44,395	31,427	617	1,024	846	190	1,036	2,600
Reading, Pa.	96,071	61,825	984	1,465	1,159	363	1,522	2,210
Richmond, Va.	127,628	165,861	2,302	4,097	3,251	2,251	5,503	11,468
Rochester, N. Y.	218,149	252,006	4,730	7,755	6,174	2,906	9,081	12,669
Rockford, Ill.	45,401	21,847	852	1,177	828	525	1,354	549
Sacramento, Cal.	44,696	69,420	1,146	2,153	1,444	1,923	3,368	4,106
Saginaw, Mich.	50,510	47,078	730	1,232	810	253	1,064	905
Salt Lake City, Utah	92,777	71,955	1,690	3,465	2,358	2,225	4,583	6,456
San Antonio, Tex.	96,614	107,996	2,091	2,629	1,851	1,862	3,713	6,149
San Diego, Cal.	39,578	85,107	1,860	3,376	2,259	1,954	4,213	10,860
San Francisco, Cal.	416,912	538,703	12,174	19,872	14,294	7,231	21,526	44,934
Savannah, Ga.	65,064	58,063	807	1,489	1,210	874	2,084	3,369
Schenectady, N. Y.	72,826	63,130	2,257	2,132	1,761	1,099	2,861	4,747
Scranton, Pa.	129,867	84,179	1,559	2,079	1,733	417	2,151	2,856
Seattle, Wash.	237,194	221,239	8,380	14,147	9,735	6,686	16,421	34,282
Sioux City, Ia.	47,828	16,252	1,061	1,601	940	593	1,534	1,647
Somerville, Mass.	77,236	77,444	1,497	1,992	1,635	247	1,883	1,650
South Bend, Ind.	53,684	32,838	815	1,313	809	441	1,250	1,079
Spokane, Wash.	104,402	87,995	1,633	3,764	2,625	353	2,979	7,859
Springfield, Ill.	51,678	15,583	839	1,263	871	362	1,233	959
Springfield, Mass.	88,926	190,365	3,093	4,181	3,136	1,165	4,302	7,704
Springfield, Ohio	46,921	59,469	594	968	766	485	1,252	2,313
St. Joseph, Mo.	77,403	42,821	1,012	1,614	1,075	836	1,912	2,671
St. Louis, Mo.	687,029	709,238	14,357	23,598	16,704	5,531	22,235	19,881
St. Paul, Minn.	214,744	169,084	4,022	5,730	4,712	1,832	6,545	10,484
Syracuse, N. Y.	137,249	157,902	2,816	4,096	3,171	1,537	4,709	9,869
Tacoma, Wash.	83,743	61,807	1,419	3,444	2,318	644	2,963	9,516
Tampa, Fla.	37,782	31,010	755	1,204	902	537	1,440	3,111
Terre Haute, Ind.	58,157	37,288	828	1,075	875	332	1,207	1,049
Toledo, Ohio.	168,497	268,710	3,108	4,568	3,411	2,316	5,727	12,073
Trenton, N. J.	96,815	86,029	1,324	2,420	2,042	651	2,694	3,141
Troy, N. Y.	76,813	65,523	1,421	2,025	1,643	337	1,980	4,965
Utica, N. Y.	74,419	64,769	1,245	1,529	1,306	640	1,946	2,843
Washington, D. C.	331,069	429,251	6,438	15,860	10,006	3,157	13,163	5,487
Waterbury, Conn.	73,141	80,635	1,369	1,758	1,443	1,210	2,654	5,018
Wichita, Kan.	52,450	64,746	990	1,518	821	116	937	2,001
Wilkes-Barre, Pa.	67,105	69,118	954	1,187	994	644	1,639	2,552
Wilmington, Del.	87,411	82,589	1,098	1,456	1,267	618	1,885	5,571
Worcester, Mass.	145,986	180,061	3,182	5,192	3,909	1,183	5,093	7,954
Yonkers, N. Y.	79,803	121,143	2,917	3,020	3,028	903	3,932	8,118
York, Pa.	44,750	26,396	425	590	444	329	773	1,188
Youngstown, Ohio	79,066	164,566	1,652	2,441	1,591	1,590	3,181	5,281

VIII. TERRITORIES AND DEPENDENCIES

FRANK MCINTYRE

ALASKA

Economic Conditions. — Notwithstanding its remoteness, Alaska is making substantial progress in the development of its resources, and while, after approximately 50 years of American government, the white population numbers only about 50,000 and the native population is not increasing, there is a constant increase in the output of the mines and fisheries with a steady development of the several other industries. The outstanding development of the year 1916 was a great increase in copper production, which exceeds the gold output by several millions of dollars.

Legislation.—The only legislation with exclusive application to Alaska passed by Congress during the year was an act approved June 22, 1916, authorizing the Secretary of Commerce to sell under certain conditions skins taken from fur seals on the Pribolof Islands; an act approved July 8, 1916, amending the United States homestead law in its application to Alaska; and an act approved Sept. 7, 1916, authorizing the town of Juneau, Alaska, to issue bonds for school and other purposes.

The local legislature, which meets in regular session each two years, will meet on the first Monday in March, 1917. The powers of this legislature are so limited and so many of the purely local matters are under the exclusive control of Congress that little can be expected from its labors, and the governor in his report for 1916 urges the grant of greater powers of local government to the people of Alaska and to their legislature.

Education.—The native schools are still under the U. S. Bureau of Education, which maintains 70 schools having an enrollment of approximately 4,000. Great stress is laid on elementary subjects, manual training and domestic science, and the employees of the Bureau of Education devote a considerable part of their time to the education of the adult native population in sanitation and hygiene.

The number of white schools outside of incorporated towns was increased during the year from 31 to 37, and the number of teachers employed in these schools from 40 to 50. The number of pupils increased from 961 to 1,407. The white schools in the incorporated towns show an increase over the preceding year from 65 to 68 teachers and the total enrollment of pupils was increased from 1,542 to 1,693.

The governor complains in his annual report of the continuance of the control by Congress of the Alaskan schools and urges that this control be transferred to the local government, without which, he reports, satisfactory progress in education cannot be made.

Health.—The Bureau of Education, charged with looking after the health of the natives in Alaska, had available for this purpose during the year $44,000. Small hospitals in charge of physicians were maintained at several points and such work as was possible was also done through the schools. The Bureau of Education has also secured the aid and coöperation of the U. S. Public Health Service. The health of the white population has continued excellent.

Railroads and Roads.—The construction of the government railroad from the coast to the interior is being pushed by the commission in charge thereof and is progressing on the coast and in the interior. Fifty miles of track have been completed from Anchorage and 13 miles graded and made ready for the track, and an additional 49 miles is under construction and will be completed early in 1917. A short line of railroad is also being constructed from a point on Controller Bay to the Bering gold fields by a private corporation. This road will be about 15 miles in length. The total railroad mileage in the territory, government and private, now being operated is 516 miles.

The Alaska Road Commission during the last fiscal year expended approximately $300,000 on highways. The total mileage constructed by this Commission was, on June 30, 1916, 922 miles of wagon roads, 627 miles of sled roads, and 2,210 miles of trails. This is an increase in the total mileage of about 64 miles for the year, while some of the trails have been improved into sled and wagon roads. Though these are not fine roads such as some of the newer roads in the United States, they meet satisfactorily conditions in Alaska and no development in that territory is more appreciated than the work of the Road Commission.

Industries.—The only striking industrial change of the year was the great development in copper mining, the result of which is shown in the increased exportation of that metal. The fisheries have continued, as in the past, to employ about 22,000 persons, with a total production varying little from the past few years. The reindeer herds continue to be the principal wealth of the natives.

Commerce.—This year has been a record year in the trade of Alaska. The following table gives the shipments from Alaska to the United States for the last three fiscal years, ending June 30:

	1914	1915	1916
Copper	$3,876,411	$5,182,004	$26,488,288
Fish	15,201,438	19,224,849	19,629,431
Gold	12,291,672	15,348,666	16,195,635
All other	2,550,663	2,896,223	3,607,720

GUAM

Administration. — Several changes have taken place during the year in the governorship of the island of Guam. On April 29 Capt. W. J. Maxwell was relieved from duty on account of illness and was succeeded by the senior naval officer present, Lieut.-Comdr. W. P. Cronan, who assumed charge until May 9. Capt. Edward Simpson acted as governor from May 9 to 30, when he was relieved by the present governor, Capt. Roy C. Smith.

Agricultural and Economic Conditions.—No improvement in the agricultural conditions was apparent during the year. As a means of rectifying these conditions and relieving the food shortage, the governor recommends the breeding of cattle and the raising of staple crops by the Government until such time as these industries can be taken over by the natives. Experiments during the year established the fact that white potatoes could not be grown profitably, but that cotton could be produced to advantage.

On Jan. 3, 1916, there was opened the Bank of Guam, with a capital of $15,000, the first banking institution of any kind ever established in the island.

During the year $4,817.04 was spent on new public works; 5,036 yds. of new roads and streets were constructed, but the present road system of the island is quite inadequate for the needs of the people and the governor recommends its immediate extension.

The native population is 13,285, an increase of 317 over the preceding year.

Education.—In November a new school building was opened at Yona, a district hitherto without school facilities. Additional buildings are urgently needed, especially one at Agana, where there are 985 school

children. Expenditures for education, exclusive of new buildings, were $7,363.95.

Instruction in agriculture and domestic science has continued. The average daily attendance is 1,674, and the number of teachers employed is 33. The number of illiterates is decreasing and the knowledge of English is increasing, but it is estimated that only about 20 per cent. of the native population over 10 years of age can read or write, and only about 10 per cent. speak and understand English.

Sanitation.—The number of medical officers is still insufficient to perform properly the duties necessary for the medical treatment of the people and the sanitation of the island, and the governor recommends a large increase in the appropriations for these purposes. Treatment of gangosa and yaws has been continued; 468 school children were given hospital treatment for hookworm and intestinal parasites. One case of leprosy was discovered during the year and two more cases are being investigated. The death rate increased from 19 per thousand in 1915 to 21.3 per thousand, largely due to an epidemic of whooping cough which caused the death of about 60 children.

Commerce and Industries.—The total imports for 1916 amounted to $329,503.23, an increase of $35,938.88 over the preceding year. The greatest increase was in those from the United States, while there was a noticeable decrease in those from Manila and Japan. The exports amounted to $66,568.20, mainly copra, which was shipped in almost equal quantities to Japan and the United States. These figures show that the balance of trade is still largely against Guam.

HAWAII

Economic Conditions.—The territory of Hawaii has been unusually prosperous throughout the year. While there was a decrease in the sugar exported from 640,459 tons in 1915 to 568,584 tons in 1916, due to the higher prices there was an increase in the value of this export of approximately $1,500,000. The principal crops continue to be sugar, pineapples and coffee. The assessable property of the territory on Jan. 1, 1916, was $206,970,229, as against $176,601,222 on Jan. 1, 1915. During this same period bank deposits increased $6,264,638.83.

Legislation.—There was no session of the local legislature during the year. Congress passed several acts ratifying acts of the legislature of Hawaii with reference to franchises and acts modifying in minor respects franchises granted in the territory. It also passed an act establishing a national park in the territory.

Population.—The population continues approximately as previously reported. The question of bringing in European laborers is held in abeyance because of the European War. The principal increase in population, other than that due to the excess of births over deaths, is among the Japanese and Filipinos.

Education and Sanitation.—Steady progress is being made in education and sanitation. It is to be noted that the report of the treatment of leprosy in the islands is by no means so hopeful as recent reports from the Philippine Islands and will doubtless cause the more hopeful reports to be received with caution. Dr. Currie, in reporting to Governor Pinkham on the work of the U. S. Laboratory investigation in Hawaii, says with reference to this matter:

> We have tried a number of new remedies and laboratory products on the patients during the year. It is difficult, at this time, to state what success, if any, we have met with in this line of work, as leprosy is a very deceiving disease, patients often improving remarkably for a long period even without treatment of any kind. It is therefore difficult to judge whether the marked improvement of a few of our patients has been due to the remedies administered or merely the improvement which often occurs during the course of the disease for a temporary period, especially when patients are given good food, nursing, and general attention such as they receive here. It would appear, however, that some of the patients that are receiving chaulmoogra oil hypodermically have improved on an average more than other groups of patients treated differently, but certainly we have not secured with this agent the rapid improvement and even cure which has been claimed for it in certain other parts of the world, although the substance administered and the mode of giving it are the same as employed elsewhere.

Exports.—The total value of domestic exports for the fiscal year 1916 was $62,195,586. The following table shows the value of the principal local products shipped from the islands during the last three fiscal years:

	1914	1915	1916
Sugar	$33,194,912	$52,953,099	$54,409,587
Coffee	824,512	650,486	418,605
Fruits and nuts (mostly pineapples)	5,061,525	6,319,129	6,889,705

PHILIPPINE ISLANDS

Political Conditions.—As reported in the YEAR BOOK for 1915 (p. 250), peace and order seem so well established in the Philippines as to make unnecessary the continuance of that heading in this article. The territory included in the Department of Mindanao and Sulu, so turbulent in the earlier years of American occupation, as in the entire period of Spanish sovereignty, is making rapid strides toward civilization under the sympathetic guidance of Governor Carpenter, who, in coöperation with every religious and charitable agency locally interested in such work, is turning the minds of the people from the squalid past to a hopeful future and to sanitation, education, agriculture, roads, etc.

Historically interesting and politically important was the renunciation by the Sultan of Sulu in an agreement with Governor Carpenter of his claims to sovereignty over the Sulu Archipelago. Governor Carpenter acted under authorization of Governor-General Harrison and a formal agreement was drawn up and signed, being in effect a definitive statement of the understanding of the declarations of Governor-General Luke E. Wright and the Sultan at a hearing in Manila, July 19 to 26, 1904, following the abrogation of the so-called Bates treaty. The following extract gives the summary of the agreement:

> The Sultan of Sulu, on his own account and in behalf of his adherents and people in the Sulu Archipelago and elsewhere within American territory, without any reservation or limitation whatsoever, ratifies and confirms his recognition of the sovereignty of the United States of America, and the exercise of His Excellency the Governor-General and the representatives of that Government in Mindanao and Sulu of all the attributes of sovereign government that are exercised elsewhere in American territory and dependencies, including the adjudication by government courts or its other duly authorized officers of all civil and criminal causes falling within the laws and orders of the Government.
>
> The Sultan of Sulu and his adherents and people of the Mohammedan faith shall have the same religious freedom had by the adherents of all other religious creeds, the practice of which is not in violation of the basic principles of the laws of the United States of America.

This agreement, which, as conclusively as a document can, disposes of the claims of the Sultan of Sulu to a sovereignty which had been exercised almost continually for over 400 years, has an importance which is by no means measured by the impotency of the Sultan in recent years to maintain his claim.

The policy of bringing about closer relations between the wild people of central Luzon and their Christian neighbors has been continued and was emphasized during the year by the appointment of Joaquin D. Luna, a Christian Filipino, to be governor of the Mountain Province, the home of the wild people.

The important event of the year in the Philippines was the passage of the Jones bill providing a new organic Act for the Islands, which was approved by the President on Aug. 29. This Act, generally speaking, changed the provisions of law of the Philippine Islands in the following respects: (1) it materially increased the powers of the Philippine Government; (2) it gave to the Filipino electorate the power to elect the upper house of the legislature as well as the lower house which alone has been elected heretofore; (3) it materially strengthened the hands of the executive power.

No change was made in the judiciary of the Philippine Islands. The justices of the Supreme Court continue, as heretofore, to be appointed by the President, while the lower judicial officers, as heretofore, are appointed by the governor-general.

As to form, the legislative power in

the Islands is given to a legislature composed of two houses. The Islands are divided into 12 senatorial districts; from each of 11 of these districts two senators are elected, and for the twelfth district, comprising the territory inhabited mainly by the non-Christian people, the governor-general appoints two senators. These 24 senators comprise the upper house of the legislature. The lower house has 90 members, 81 elected from an equal number of districts, and nine appointed by the governor-general to represent the non-Christian territory. The members of the legislature thus selected by the governor-general may be appointed without the consent of the Senate. While the legislature is given power to redistrict the Islands and modify and amend or repeal any of the provisions of the law having to do with the qualifications of electors or date of elections, this power does not extend to the provisions with reference to appointive senators and representatives.

Elections are to be held every three years; senators are elected for a period of six years, and representatives for a period of three years. The governor-general is given a qualified veto power, but legislation may not be passed over his veto without the approval of the President of the United States. Heretofore the governor-general, being a member of the upper house, had no veto power.

The chief executive of the Islands is the governor-general appointed by the President, who holds his office at the pleasure of the President. He has the appointive power which governor-generals have had in the past, in addition to which he appoints the heads of the executive departments with the advice and consent of the Philippine Senate. He submits the budget of receipts and expenditures which is the basis of the annual appropriation bills, and he has the veto power as to any item in the appropriation bills. In addition to the foregoing, he has all of the powers usually given to territorial governors, and it is required specifically that all executive functions of the Government must be directly under the governor-general or in one of the executive departments under his supervision and control.

The President also appoints a vice-governor of the Islands, who is to be the head of the Department of Public Instruction, including the Bureau of Education and the Bureau of Health. The President also appoints an auditor and a deputy auditor for the Islands. The auditor has all the powers usually given to an auditor and a comptroller.

The Philippine legislature, as constituted under this act, met in its first regular session on Oct. 16, 1916. The passage of the new organic act by Congress met with the enthusiastic approval of the Filipino people. The cordial relations between the administration of Governor-General Harrison and the people of the Islands have continued throughout the year.

Eugene E. Reed, of New Hampshire, was appointed Secretary of Commerce and Police, *vice* Clinton L. Riggs, who resigned Oct. 31, 1915. Winfred T. Denison, Secretary of the Interior, resigned on March 3. This vacancy has not been filled.

The most important legislation passed by the Philippine legislature at its 1915 session were the acts authorizing the purchase of the stock of the Manila Railroad Co. and creating the Philippine National Bank. The negotiations concluding the purchase of the stock of the railroad are just about being completed. The Philippine National Bank authorized is now in operation. The Act creating this bank contemplated turning over to it the greater part of the fiscal affairs of the Government, including the old Government Agricultural Bank, while at the same time the bank is authorized to engage in all of the commercial branches of banking.

Education. — Substantial progress has been made in the Philippine Bureau of Education in connection with the extension of the public-welfare work, including the playground movement, social activities, care of children, health and sanitation, athletics, and the use of schools as social centers. One of the special features of the year 1915 was the school exhibit at the Panama-Pacific International Exposition, the most pretentious the public schools have ever attempted.

School work among the non-Christians has received increased attention.

Aside from the regular appropriations for non-Christian school work, $500,000 was set aside by the Philippine Legislature for schools in the Department of Mindanao and Sulu. Considerable progress has been made in the programme for adequate school buildings and sites. The number of schools in operation in December, 1915, was 4,386, as compared with 4,187 for the previous school year. The total annual enrollment for that part of the school year ending December, 1915, was 606,597, which for that fraction of a year is greater than for any previous similar period. The average daily attendance through December reached 473,213, as against 441,742 in the preceding year. In December, 1915, of the 10,702 teachers on duty, 488 were Americans and 10,214 were Filipinos. This represents an increase over the preceding year of 907 Filipino teachers and a decrease in the number of American teachers of 50. The reduction in the number of American teachers means a loss in efficiency at a time when progress would naturally be most rapid as a result of previous preparation. The number of American teachers, it is believed, should be kept at the minimum of about 700 unless the fruits of intensive preparation are to be in part lost.

Sanitation.—On July 1, in accordance with the provisions of an act, mentioned in the last issue of the YEAR BOOK (p. 251), a complete reorganization of the Bureau of Health went into effect. A noticeable feature of the reorganization is the creation of a Council of Hygiene, which acts in an advisory capacity to the director of health and brings the health service into closer consultation with representatives of the public. The attitude of the people generally toward sanitation has decidedly improved.

In accordance with the new act, steps were taken immediately to reorganize all the provinces for the purpose of obtaining a higher degree of sanitary efficiency, and at the end of the year 1915 44 municipalities were organized into sanitary districts and plans completed for organizing 100 more on Jan. 1, 1916. The sanitary methods used in the Philippines are now adopted and followed as models by health authorities in other parts of the Orient.

The work of the hospitals already established in the provinces has continued to progress, and the attendance at hospitals and dispensaries has markedly increased. New hospitals began operations during the year at Tacloban and Puerto Princesa. A special effort has been made to improve the sanitary conditions in the Mountain Province, and the number of doctors and nurses and inspectors has been considerably increased. The extension of the work of the public-health service into the Department of Mindanao and Sulu has progressed and several new dispensaries have been established. The Sulu Public Hospital at Jolo was formally opened on Nov. 7.

Generally speaking, the Islands were remarkably free from communicable diseases during 1915, though there was an epidemic of cholera which was most noticeable in the provinces of Mindanao and Sulu. Up to the end of the year this resulted in 3,573 cases, with 2,820 deaths in those provinces, and 66 cases with 44 deaths in Manila. The disease has since made some headway, but is being effectively controlled. Of the 23 lepers discharged in 1915, apparently cured by chaulmoogra-oil treatment but under observation for two years, none has been reported as having leprosy (*A. Y. B.*, 1915, p. 251).

A forward step toward the improvement of the citizens and the increase of the population of the Islands has been taken by the Government in the passage of an act appropriating $500,000 for work in connection with the reduction of infant mortality, which is the first time the Government has taken up this task in a large way.

Commerce and Industries.—The decline in the foreign trade of the Islands during the last four months of 1914, owing to the European War, has been overcome to some extent and has resulted in a shifting of trade channels. There has been a general falling off of imports from sources other than the United States and higher average prices of imported merchandise. The value of trade with the United States in 1915 represents the highest figure ever reached in any

calendar year. The total trade in 1915 was larger than in any calendar year in the history of the Islands with the exception of 1912, in which year the trade value was inflated by the largest rice imports on record. The increase in the value of 1915 imports was due mainly to heavy importations of rice and cotton goods. The total value of exports was higher than for any previous year, except 1912, the increase being made up principally of copra and hemp. Copra shows the largest increase of any export product, while cigars show a decrease. The quantity of sugar exported was less than during the previous year, partly due to the lack of shipping facilities, but the high price it commanded was responsible for the increase shown in the value of sugar exportations. Notwithstanding the heavy rice imports and the decline in the prices of staple products, except sugar, the year 1915 closed with a trade balance of over $4,500,000 in favor of the Islands, as shown in the following table:

Twelve months ending December	Imports		Exports	
	From the U. S.	From Other Countries	To the U. S.	To Other Countries
1911	$19,156,987	$28,867,420	$19,827,030	$24,760,261
1912	24,309,010	37,358,941	22,814,238	31,970,500
1913	26,676,261	26,636,525	16,434,018	31,338,938
1914	24,020,395	24,568,258	24,427,710	24,261,924
1915	26,381,069	22,931,114	23,653,211	30,159,793

PORTO RICO

Economic Conditions.—The economic embarrassment under which Porto Rico has been laboring for the last three years has completely disappeared and the island is enjoying remarkable prosperity. The extraordinary revival of the sugar industry is the chief factor in this restoration of prosperity; it is due to the high price of sugar and the repeal of the free-sugar clause of the Simmons-Underwood tariff.

A prolonged drought fully tested and proved the value of the new irrigation system, and efforts are being made to extend the works so as to include about 9,000 acres of land not now reached. It is largely due to the irrigation service that the increase in the production of sugar was so great.

During the year there was another strike among the agricultural workers in the sugar-cane fields, the object being to secure higher wages and shorter hours of labor for the workers as their fair share of the extraordinary prosperity of the sugar industry. The strike involved some 30,000 to 40,000 laborers and achieved a part of its purpose.

Political Conditions.—On May 23 the House of Representatives passed the Jones bill providing a new organic act for Porto Rico and making citizens of Porto Rico citizens of the United States (*A. Y. B.*, 1915, p. 253). This bill was reported with amendments to the Senate on July 3 but it was impossible to secure its passage at the last session of the Senate. In addition to making citizens of Porto Rico citizens of the United States, the bill contemplates a more autonomous government in Porto Rico, replaces the present Executive Council as the upper house of the legislature by an elective Senate, and provides for the appointment of the heads of the executive departments by the governor of the territory, instead of, as heretofore, by the President of the United States, with the exception of two to be appointed by the President.

In the hope that this bill will pass at the short session of Congress, Congress postponed the election which would have taken place in November to a date to be hereafter fixed by the President of the United States, the idea obviously being that if the new bill should pass the first election would be shortly thereafter under the terms of the new law. In case the bill should fail of passage, then the President may fix a date for the election under the old law. The general principles of the bill meet almost universal approval in Porto Rico and the

passage of the bill is earnestly urged by the governor.

The second session of the eighth Legislative Assembly convened on Feb. 14 and adjourned on April 13, after passing 80 laws and 23 joint resolutions. The most important legislation was the passage of an act to provide additional revenues by means of a heavier taxation on the property of the island. Other important acts were one for the relief of workmen injured in their trades, an act authorizing the issuance of $2,000,000 bonds for the construction of roads and bridges, and $1,000,000 bonds to provide capital for the insular Bank of Porto Rico, an act providing for the standardization of government supplies and the centralization of government purchases of supplies, and an act to repress usury.

Education.—In spite of reduced appropriations, the work of the Department of Education continued with energy, but much remains to be done to meet the pressing needs of the growing population. The real situation as to educational progress in Porto Rico is revealed by the fact that of the 419,599 children of school age, only 151,662, or 35.8 per cent., were enrolled in the public schools; and of the school population in the rural barrios only 26 per cent. were enrolled.

The number of teachers employed was 2,488, of whom 2,296 were Porto Ricans and 172 were Americans, and the number of school buildings used was 1,506. During the year 59 new sites for school buildings were acquired and 83 new school buildings have either been completed or are in process of construction. The amount expended for educational purposes during the fiscal year ended June 30, 1916, was $1,840,016.

An important addition to the public buildings was the new Carnegie Library in the city of San Juan, costing $100,000, which was completed and opened with appropriate ceremonies on July 27.

Sanitation.—It has been difficult to maintain the standard as to general health conditions on account of a large reduction in appropriations for the sanitation service. Two slight epidemics were suppressed, that of dengue fever in October, 1915, and smallpox in May. In stamping out those diseases the work of suppressing mosquitoes and of vaccinating about 100,000 people proved of substantial benefit to the community. The general mortality rate increased from 19.78 per thousand in 1915 to 21.9 in 1916. The work of sanitary surveys of water sheds has been continued. New sanitary regulations include those in connection with tenement houses, slaughter houses, bakeries, dairies, cemeteries, disposal of corpses, etc.

Industries and Commerce.—For the first time in the history of the island the total external trade in 1915 exceeded one hundred million dollars, nearly 92 per cent. being with the United States. The exports were valued at $66,731,573, the highest ever recorded. This is an increase of about 35 per cent. over the exports of any previous year, the increase in sugar alone amounting to $18,530,691. The 1916 sugar crop was 42,255 tons in excess of the highest previous record. On the other hand there was a considerable decrease in the exportation of articles other than sugar, notably coffee, which, due probably to climatic conditions, decreased about 37 per cent. in quantity and more than two million dollars in value. The total value of fruits exported shows a decrease of approximately $86,000. There was a decline in the pineapple exports of $547,457 caused by unfortunate weather conditions, and an increase in the exportation of oranges, canned pineapples, cocoanuts and grapefruit. Imports during the year were valued at $38,951,156 as against $33,884,296 in 1915, $4,962,684 of this gain being with the United States. (See also XX, *External Commerce.*)

The development of agriculture has received as careful attention as is possible with the organization and resources at the command of the Government. Internal trade has expanded in various directions. Sixteen new domestic corporations with a paid-up capital of $187,900, and 14 foreign corporations with a paid-up capital of $21,407,100 were officially registered in 1915 and authorized to transact business. Of the domestic

corporations about one-half were for the purpose of establishing manufacturing industries.

The total exports for the past three fiscal years are shown in the following table:

	1914	1915	1916
Sugar	$20,240,335	$27,278,754	$45,809,445
Coffee	8,193,544	7,082,791	5,049,283
Tobacco	8,962,647	8,987,870	8,587,852
Fruit	3,400,903	3,441,157	3,355,285
All other	2,305,333	2,566,335	3,929,708
	$43,102,762	$49,356,907	$66,731,573

AMERICAN SAMOA

The year has been a prosperous one in American Samoa. There have been no severe storms and there are favorable prospects for an abundant copra crop. The contract price received for copra, $108.66 per ton, is the highest in the history of the island government, due partly to the resumption of the steamship service to San Francisco by the Oceanic Steamship Co.'s vessels. There is now a steamer each three weeks to and from the United States, and an increased volume of trade is expected as a result of improvement in the steamship service. Owing to the hurricane of 1915 in the islands of the Manúa group, no copra was produced there that year. During 1916 work has been done on the codification of the laws and regulations of the island government and on the taking of a census of the islands.

There have been no epidemics during the year, and health conditions are excellent. The first class of native Samoan girls to receive hospital training in nursing was graduated on Feb. 22. The people of Samoa have been greatly benefited by the work of the Medical Corps of the Navy, and it is thought that these native graduates will be of great assistance in the way of further improvements. The governor has again called attention to the importance of an additional supply of fresh water for naval vessels.

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IX. LAW AND JURISPRUDENCE

NATHAN ABBOTT

LEGISLATION [1]

Legislative Tendencies.—The legislation in the United States during the year 1916 is of exceptional interest. There is a manifest desire to attain more efficient and economical agencies for governmental administration. The importance of control over the artistic element in houses and streets is recognized in the establishment of art commissions. The election laws have been amended in important particulars, and in some cases voting by nonresidents has been made possible. The influence of the war in Europe appears in the increase of legislation not only as regards the Army and Navy, but in the extension of military instruction in training in the schools, in provision for military roads, and in enforcement of respect for the national flag. Perhaps the general spirit of the nation is as well reflected in the so-called Stiver's Act in New York (Laws of New York, 1916, Ch. 568) as in any other legislation. By this Act, if after a call for volunteers, there is not a response sufficient to meet the Federal requirements, then the sovereign power of the state is invoked and compulsory military service may be enforced by a draft.

Labor legislation has taken the form mainly of employers'-liability acts, or of measures improving the sanitary condition of the laborer's place of working. The Federal act prohibiting interstate commerce in the products of child labor is notable.

Acts in aid of conservation of natural resources have been numerous. One in Kentucky providing for instruction in the public school on fire dangers and losses should be mentioned.

Under the topic of "Property," an act of the Massachusetts legislature (Ch. 108) is given in full below because it is an example of intelligent legislation to remedy an archaic rule of the common law, expressed with a brevity and perfection of style that is highly to be commended.

In this connection reference should be made to a "Legislative Manual," to contain directions or suggestions for drafting laws, now in process of preparation by a committee of the American Bar Association, a report of which committee appears in the current report of the Association.

Organization and Administration of State Government.—New Jersey. (Ch. 48), to increase the efficiency of the various departments of the state government, makes provision for the exchange of the services of experts in the departments; two or more departments may combine to carry on work germane to both and to divide the expenses rateably. Chapter 15 creates a budget system to aid in determining the financial condition of the state and the necessary appropriations. By Chapter 68 the power to purchase supplies for the state or its departments is vested in a commission; the office of state purchasing agent, with a salary of $5,000, is created to execute the provisions of the Act; an ad-

[1] Certain important subjects of legislation omitted from this summary are reviewed in detail elsewhere in the YEAR BOOK, as follows: agriculture, XVII, *Agricultural Legislation;* constitutional amendments, VI, *Amendments to State Constitutions;* criminal law, IX, *Criminal Law;* labor, XVI, *Labor Legislation;* penal administration, XV, *Penology and Criminology;* public utilities, XI, *Public Services,* and XXI, *Railroads;* and taxation, XI, *Public Services.* References are given throughout this section to other departments in which specific topics are treated at greater length. The Index should always be consulted for complete references to any particular subject of legislation.

visory board of representatives of the several state institutions and departments is provided; and all three are to coöperate in carrying out the purposes of the Act. Chapter 84 creates a commission to codify the statutes relating to cities and towns, in the interest of local self-government, and to facilitate future legislation by removing confusion and uncertainty. Virginia (Ch. 199) creates a committee on publications to study the best and cheapest way to publish books used by the various departments and schools of the state (Ch. 211): creates a Commission on Economy and Efficiency to study how the state and local governments can be more efficiently and economically organized and administered; and (Ch. 400) creates an Art Commission to pass upon the purchase or change of works of art for the state. (See also VI, *State Administration.*)

Maryland (Ch. 560) creates a Department of Law, with the attorney-general at its head; he shall advise enumerated boards and commissions, and no other legal adviser may be retained by them. By Chapter 474 the Department of Legislative Reference is required to investigate the laws of Maryland and other states when requested by the governor, members of the legislature, or the head of any state department, and to collect information regarding and to prepare or aid in preparing proposed legislation, and to collate and index all information obtained and have the material accessible to officials and the public.

Massachusetts (Ch. 2) requires the consent of the governor and council to an increase in the salary of a subordinate in the employ of the state who has an annual salary of $1,000 or more. Virginia (Ch. 451) provides for speedy removal of state officials guilty of neglect of duty or misconduct, or who are intoxicated in public, or gamble or violate any penal statute involving moral turpitude. Oklahoma (Initiated Measures, p. 123) makes drunkenness a cause for impeaching state officers.

Kentucky (Ch. 15) and Mississippi (Ch. 105) define and regulate lobbying. They require the names of agents employed by corporations to promote or oppose legislation and the subjects of legislation as to which they are employed to be filed with the secretary of state. No contingent fees may be contracted for and an itemized account of expenses incurred must be filed with the secretary of state.

Local Government.—Massachusetts (Ch. 223) authorizes cities, excepting Boston, to create departments for buying city and fire-department supplies, subject to the referendum. Kentucky (Ch. 54) and Mississippi (Ch. 148) authorize cities to buy or construct electric-light, gas and water works, and also to furnish light, gas or water to other cities or individual consumers living within three miles of the cities. New Jersey (Ch. 162) authorizes municipalities to establish docks, warehouses, industrial buildings and shipping and transportation facilities; erect (Ch. 171) buildings suitable for conventions, exhibitions, entertainments, receptions, and lectures, and (Ch. 174) warehouses and stables at an expense not to exceed $20,000 for land and buildings; and (Ch. 239) maintain "white ways" lighted by electricity, taxing abutting property owners therefor. Maryland (Ch. 70) confers a like power on the city of Hagerstown as regards "white ways." (See also XI, *Public Services.*)

New Jersey (Ch. 59) authorizes the use of the public parks and other public places in cities for playgrounds for school children; authorizes (Ch. 251) cities to acquire unsightly and neglected burying grounds, transfer title to the lots, remove bodies, and devote the ground to public uses; and provides that municipal plan and art commissions (Ch. 175) shall make plans for the systematic development of a city when it deems it advisable, and (Ch. 231) in towns and villages may regulate the construction of dwellings and other buildings. Massachusetts (Ch. 190) authorizes cities to appoint boards to pass upon any proposed street or private way; its plans and the method of drainage of adjacent territory being submitted. Rhode Island (Ch. 1373) created a commission to provide plans for a harmonious and attractive treatment of a barren area of land in Providence, with particular regard to promoting

public convenience and beautifying the landscape. (See also VII, *City Planning.*)

New Jersey (Ch. 279) and New York (Ch. 108) authorize cities and villages to create publicity funds to be expended in advertising their advantages as summer or winter resorts, or as places for conventions, in displaying their products, or for otherwise promoting their industrial and commercial welfare.

Courts, Attorneys, Officers of Justice, and Procedure.—California (Ass. Con. Res. No. 2) invites the Bench and Bar to submit recommendations for the prevention of delay in legal proceedings. Massachusetts (Res. 43) provides for a commission to consolidate the statute law and make it concise and intelligible, and (Res. 30) creates a commission to consider the advisability of abolishing the ancient office of trial justice. Mississippi (H. Con. Res. 18; S. Con. Res. 29; Ch. 161) provides that the judges of the Supreme Court shall be elected by the people, instead of appointed by the governor.

Congress (No. 57) makes it unlawful for any person practicing before any department or office of the Government to use the name of a Congressman or government official "in advertising the said business." Maryland (Ch. 695) and Massachusetts (Ch. 292) prohibit corporations from practicing law, but they may insure and defend titles, and newspapers may answer inquiries on law points. Mississippi (Ch. 107) creates a state Board of Law Examiners, prescribes the subjects for examination and requirements for admission to the bar, and provides that those having the degree of LL.B. from the State University are entitled to admission.

Virginia (Ch. 204) creates the office of public defenders in cities of 50,000 inhabitants, and (Ch. 373) provides compensation for attorneys who are appointed to defend the poor. New Jersey (Ch. 132) gives one dollar to persons detained in jail as witnesses in criminal cases for each day's detention, except Sundays. Maryland (Ch. 646), Massachusetts (Ch. 3) and Virginia (Ch. 282) enact substantially similar laws. Mississippi (H. Con. Res. 43 and Ch. 162) permits nine or more jurors in civil suits to agree on a verdict as the verdict of the jury.

Massachusetts (Ch. 184), Tennessee (Chs. 182, 183) and Virginia (Ch. 449) provide for more convenient service on and remedies against partnerships, voluntary associations and joint tort-feasors. New Jersey (Ch. 221) requires all writings for record to be in English. Virginia (Ch. 209) provides that "the time from or after which or within which an act may be done, or the time before or after a given date, shall be computed by excluding the first day and including the last day of the period."

Rhode Island (Ch. 1259) permits evidence of statements by a deceased person and memoranda and entries made by him, and evidence of his acts and habits of dealing to be given in defence to actions against his personal representative. Virginia (Ch. 287) requires a defendant to set forth the facts where he relies on plaintiff's contributory negligence, and (Ch. 73) gives a speedy relief to undefended money claims. New York (Ch. 313) provides that income payable to one for life shall on his death between pay days, or on his transfer, be apportioned so that his personal representative or he and the one next entitled shall receive a proportion of the income according to the time from the last pay day to the death or transfer. New Jersey (Ch. 62) and Virginia (Ch. 406) abolish bills of exceptions and writs of error and substitute certificates of rulings.

South Carolina (Ch. 363) prohibits the rural police from receiving any fee for collecting debts excepting delinquent taxes. Virginia (Ch. 281) permits cities of 15,000 inhabitants to have one policewoman, and of 60,000 to have two; and (Ch. 300) women may be deputy clerks in the courts.

Elections.—Illinois (special session, January, 1916) amended its primary-election law. Kentucky (Ch. 13), in an act to promote pure elections, prohibits corporations from contributing to campaign expenses. Massachusetts (Ch. 16) provides that, on the primary ballot for candidates for delegate to the national convention, preferences for President shall be put on the ballot, if with the consent of the preferred, which may

be by telegraph, and if the candidate declare it; permits (Ch. 80) aid to the blind and those physically disabled in preparing ballots under the Australian system; and (Ch. 179) provides means to prevent the voters of one political party from voting in the primaries of another political party, but the latter act must be referred to the people at the next annual election for approval or rejection (see also II, *Popular Government*). Maryland (Ch. 160) abolishes the "envelope system" of voting in primaries, and (Ch. 292) adds a provision requiring voters to disclose their party affiliations when registering (see *ibid.*). New Jersey (Ch. 277) permits registration by affidavit where personal registration is prevented by illness or absence from the state. New York (Ch. 537) reënacts its election laws. Oklahoma (Ch. 25) permits voting in another precinct when the voter is out of his own county, and Virginia (Ch. 369) permits absent voters to vote by registered letter, if notice is given to the registrar of his precinct. South Dakota (Ch. 3) amends its law by a provision for a popular expression for party nominations of President and Vice-President, presidential electors and delegates to the national conventions of each party.

The "grandfather clause" of the Oklahoma constitution, an amendment making ability to read and write any section of the state constitution a qualification for voting except in the case of certain persons and their descendants, was held unconstitutional by the U. S. Supreme Court (Guinn *v.* U. S., 238 U. S. 347; *A. Y. B.*, 1915, p. 263). A new amendment is now proposed (p. 144) making the exception to the "read and write" test persons

who, prior to the adoption of this provision, served in the land or naval forces of the United States, or in the war with Mexico or on either side in any war with the Indian tribes located within the United States, or on either side in the Civil War, or in the National Guard or militia of any state or territory of the United States, or in the land or naval forces of any foreign nation and all lawful descendants of any such person, and of those that served on the side of the Colonies in the American Revolution, and in the land or naval forces of the United States in the War of 1812, or any person prevented by physical disability from complying with such test.

National Defense and the Flag.—Congress in the National Defense Act (see I, *American History;* and XII, *The Army*) provides that there shall be no discrimination in theaters and public places against persons in the uniform of the United States military forces. Massachusetts (Res. 92) creates a board to investigate the matter of establishing a state constabulary or police force which would relieve the militia of police duty. New York (Ch. 353) amends the power of the sheriff or other officer in overcoming resistance to process by withdrawing therefrom the right to call upon "any military company or companies in the county, armed and equipped," and (Ch. 355) transfers it to the governor on request of the sheriff or the mayor of a city or town where there is in fact a riot or resistance to process or apprehension thereof; and (Ch. 568) gives the governor of the state power to draft or call for volunteers in case of insurrection or riot or imminent danger thereof. Virginia (Ch. 433) prohibits discrimination by common carriers, and in places of public amusement against persons in the uniform of a United States soldier or sailor.

Kentucky (Ch. 43) recodifies its military code. Massachusetts (Ch. 123) authorizes the acceptance by the state of gifts of aeroplanes to be operated by members of the militia; provides (Ch. 126) that state employees while in the military service shall receive pay without loss of pay as a state employee; authorizes (Ch. 127) the transfer to the Federal voluntary army or navy other than the regular army of units of the state militia; requires (Ch. 209) not less than 14 days' training yearly by the volunteer militia; and authorizes (Ch. 8) students under supervision to drill and parade with firearms. Congress (No. 94) incorporates the Boy Scouts of America, a corporation to promote the ability of boys to do things for themselves and others, to train them in scout craft, and to teach them patriotism, courage and self-reliance. Maryland (Ch. 23), Massachusetts (Res. 90), New Jersey

(Ch. 211) and New York (Ch. 566) create commissions to promote the physical training of boys and girls with reference to higher efficiency in time of war, and Louisiana (Ch. 131) requires instruction for at least one hour a week in military science and tactics.

Maryland (Res. 2 and 7), Mississippi (Ch. 118), South Carolina (Ch. 537) and Virginia (Chs. 169 and 356) provide for a national flag on public schools, prohibit its use in advertising, and attempt by celebrations or instruction to increase respect therefor.

Education.—Congress (No. 52) incorporates William Dean Howells, 48 others who are named, and their successors, as the American Academy of Arts and Letters, for "the furtherance of the interests of literature and the fine arts." It shall consist of not more than 50 regular members, with power to fill vacancies, and elect associate members. New York (Ch. 545) incorporates Dent D. Upson and five others as the Institute for Public Service, to receive funds and apply the same to conduct in New York and other localities a training school for public service through assignments of practical field work; to study methods of securing efficient citizenship that will provide non-political and non-partisan attention to the methods and needs of public business, higher education and benevolent foundations; to study the management of public business, the methods of preparing budgets; to search for strong administrators and for large opportunities that need efficient men. New York (Ch. 268) incorporates Cyrus Adler and 19 others as the United Synagogue of America, whose object is

the advancement of the cause of Judaism in America, and the maintenance of Jewish tradition in its historical continuity; to assert and establish loyalty to the Torah and its historical exposition; to further the observance of the Sabbath and the Dietary laws; to preserve in the service the reference to Israel's past and the hopes for Israel's restoration; to maintain the traditional character of the liturgy, with Hebrew as the language of prayer; to foster Jewish religious life in the home, as expressed in traditional observances; to encourage the establishment of Jewish religious schools, in the curricula of which the study of the Hebrew language and literature shall be given a prominent place, both as a key to the true understanding of Judaism and as a bond holding together the scattered communities throughout the world.

Kentucky (Ch. 19) requires that fire prevention be taught in the schools at least one hour per week; provides (Ch. 20) for agricultural home extension work, and home economics, and provides funds to be used to develop children's corn, horticultural and poultry clubs; provides (Ch. 73) for a census of adult illiterates, and provides (Ch. 81) that high schools may be jointly maintained by adjacent counties. Massachusetts (Ch. 95) provides for coöperative courses in public schools, courses in which "technical or related instruction is given in conjunction with practical experience by employment in coöperating factory, manufactory, mechanical and mercantile establishment or workshop"; authorizes (Ch. 185) cities which so vote on referendum to maintain schools for instructing families and individuals by day, part time or evening classes, in gardening, fruit growing, floriculture, poultry keeping, animal husbandry and other branches of agriculture and horticulture.

Mississippi creates commissions (H. Con. Res. 58) to prepare a code of school laws, and (Ch. 110) to investigate adult illiteracy in the state; and provides (Ch. 179) for the purchase of school text-books to be sold to the pupils at not more than 15 per cent. advance on the net wholesale price. New Jersey (Ch. 13) and New York (Ch. 90) provide for the systematic collection of small sums of money from school children so as to encourage thrift. New Jersey (Chs. 76, 102, and 242) facilitates vocational education; requires (Ch. 263) at least five verses of the Old Testament to be read at the opening of each school; and requires (Ch. 152) the approval of the state board of education of all degrees based on proficiency or learning. New York (Ch. 567) provides for physical training of school children above the age of eight years under military advice.

Highways.—The subject of the highways and traffic thereon has received much consideration in the legisla-

tures. Congress (No. 156) enacted the Federal Aid Road Act whereby the federal authorities are to coöperate with the authorities of such states as shall assent, in the construction of rural post roads (see X, *Highways*). New Jersey (Ch. 285) creates a commission to lay out 13 main state roads to be as direct as possible between certain important points, the cost, estimated at $7,000,000, to be paid out of motor-vehicle license fees; the Act is to be referred to the people. Several states enact or reënact motor regulations in the usual form. Massachusetts (Ch. 42) and New York (Ch. 72) provide for exchange of statutory rights and duties as regards motorists.

Mississippi (Ch. 93) makes the license on motors transferable with the car. Maryland (Ch. 451) creates a lien on motors in favor of garages and those who have made repairs or furnished gasoline. Massachusetts (Ch. 124) regulates the spreading of tar or oil on highways. New Jersey (Ch. 24) gives pedestrians the right of way over vehicles at street crossings where houses are on the average less than 100 ft. apart; regulates (Chs. 104 and 215) the distance at which a light must show before and behind a vehicle on the road; prohibits (Ch. 114) muffler cut-outs; requires (Ch. 163) notice of accidents by motors causing damage above $10. to be given in writing to the commissioner of motor-vehicles, and (Ch. 148) makes it illegal to give chauffeurs a commission for bringing in business.

Rhode Island (Ch. 1371) and Oklahoma (Ch. 41) regulate the weight of load permitted in "trail cars." Mississippi (Ch. 116) provides that in suits for injuries from motors, the plaintiff shall make out a *prima-facie* case by showing the fact of the injury and the violation of the statute. Jitneys, trolley motors, or trackless motors and autobusses are legalized in Massachusetts (Chs. 266 and 293), New Jersey (Ch. 136) and Rhode Island (Ch. 1263). New York (Chs. 13 and 14) authorizes auto-casualty insurance companies and insurance of the car itself.

Conservation.—The protection and conservation of natural resources was the subject of a large amount of legislation during the year. This is manifested more in the form of local than in general statutes, but even in the case of the latter it is obvious enough. Massachusetts (Ch. 51) prohibits fires in the open air between March 1 and Dec. 1 without the written permission of certain fire officers, except fires of rubbish in ploughed fields, or by persons over 18 years of age on sandy or marsh land or beaches, to be enclosed by stones and away from woods and buildings, and properly attended. New Jersey (Ch. 44) distinguishes between wilful and innocent violations of the fire laws, and permits one who violates the law to pay the cost of extinguishing the fire, or other expenses; and (Ch. 189) authorizes small municipalities to enact ordinances for the protection of life and property from fire, and for the storage of inflammable substances. New York amends (Ch. 451) its conservation law with especial reference to forest fires and damages from fires negligently set. Virginia (Ch. 268) increases the penalty for setting fires in woods and those by which the property of others is "jeopardized."

Many enactments were made regulating the taking of game, fish and oysters, in some cases discriminating between residents and non-residents as regards the privilege. Congress (No. 100) directs an investigation into the damage caused by the dogfish and other predacious fishes and to discern the best way to take and utilize them. Kentucky (Ch. 29) prohibits the use of explosives in taking fish. Maryland in numerous local acts protects its fish and game, and by Chapter 682 creates the Conservation Commission of Maryland, to consist of three citizens of the state,

> all of whom shall be men specially informed in one or more of the following subjects: oysters, clams, fish, crabs, terrapin, wild fowl, birds, game, and fur-bearing animals . . . the main object of this article being to centralize and vest in the Conservation Commission entire control of the above-mentioned natural resources of the state.

Massachusetts (Ch. 110) prohibits taking water fowl with the aid of artificial lights or motor boats. Mississippi (Ch. 99) creates a Fish and

Game Department for enforcing the game laws. New Jersey (Ch. 286) and Rhode Island (Ch. 1229) provide refuges for wild birds and game. New York (Ch. 77) provides that wild birds, excepting the English sparrow, starling and owls, may not be killed (see also Ch. 451, New York). Virginia (Chs. 54 and 58) makes it unlawful to buy or sell plumage of wild birds, except of game birds, or the buying or selling of wild turkeys; and (Ch. 152) creates a Department of Game and Inland Fisheries, and emphasizes the enforcement of the game laws, and the care of fires in the woods.

Health.—New York (Ch. 328) prohibits the conferring of a degree of doctor of medicine after Jan. 1, 1917, on one who has not had a four-years' high-school course or its equivalent, and provides (Ch. 413) for town physicians who shall attend poor persons at the request of town officers. New Jersey (Ch. 202) provides for visiting nurses for municipalities, who may be permanently engaged, and (Ch. 214) for the care of the needy who are sick. Kentucky (Ch. 35) prohibits "buying and selling patients," and Virginia (Ch. 498) prohibits physicians from dividing fees. Rhode Island (Ch. 1226) requires physicians to report occupational diseases. Louisiana (Ch. 163) prohibits nurses from giving anæsthetics except under the direction of a physician. Mississippi (Ch. 109) requires physicians to report cases of tuberculosis.

Massachusetts (Ch. 286) provides for the care of needy persons who have tuberculosis, and Mississippi (Ch. 109) for its prevention and treatment. New Jersey (Ch. 32) provides for employing nurses to discover cases of tuberculosis and to give instruction in its prevention. Virginia (Ch. 226) permits the restraint of persons having tuberculosis who may be a menace to others.

Virginia (Ch. 357) allows "drug fiends," if dangerous or likely to become a public burden, to be committed to a hospital for the insane. Massachusetts (Ch. 112 of Resolves) provides for an investigation into the extent of the use of habit-forming drugs, and the efficiency of the laws regulating them, and authorizes (Ch. 117) search warrants where it is suspected that opium, cocaine or other hypnotic drugs are unlawfully stored. Massachusetts (Res. 47) authorizes the expenditure of $10,000 for buying preventives of the transmission of syphilis or in investigation into making them. South Carolina (Ch. 551) requires the state Board of Health to make the Wassermann test without charge. Mississippi (Ch. 115) provides for the prevention of blindness from inflammation of the eyes of the newborn. New Jersey (Ch. 22) provides for an investigation into the causes of blindness; authorizes (Ch. 61) colonies of feeble-minded males on the state forest reserve; and (Ch. 94) makes elaborate provisions for committing a person to an institution for the insane.

New York (Ch. 408) creates a county mosquito-extermination commission with power to enter on any lands, and (Ch. 199) regulates the keeping of swine within village limits. Rhode Island (Ch. 1277) authorizes the city of Providence to pay $500 to defray the expenses of disposing of homeless stray cats. Virginia (Ch. 427) requires the cremation of animals or fowls that have died from a contagious disease, and (Ch. 50) requires sanitary practice in slaughter and packing houses, and other places where animals are prepared for food. Rhode Island (Ch. 1201) exempts from vaccination a child "who is not a fit subject" for it. New York (Ch. 371) provides for the quarantine of "carriers of typhoid-fever bacilli."

Maryland (Ch. 242) requires hotels and boarding houses to report guests who have infectious diseases and (Ch. 18), with Rhode Island (Ch. 1238) and Virginia (Chs. 160 and 278), prohibit common towels and common drinking cups in public places. New York (Ch. 295) makes a state reserve of the Saratoga mineral springs, and Virginia (Ch. 360) vests the supervision of the water supply of the state in the Board of Health where the quality of the water furnished may affect public health. New Jersey (Ch. 233) requires the Board of Health to approve of burial vaults partially or wholly above ground.

Food.—Maryland (163) defines "cold storage" and requires a license from the Board of Health before engaging in the business. New Jersey (Ch. 101) regulates the business, defines the "articles of food" that may be stored, and makes it unlawful to sell food after storage for more than 30 days unless placarded "cold-storage goods." Rhode Island (Ch. 1190) defines "cold-storage eggs," and requires the container in which such eggs are sold to be marked, or, if not in a container, that a sign shall be on the counter or near the eggs. Kentucky (Ch. 37) regulates the sanitary conditions where food is prepared for sale, and (Ch. 44) provides for the analysis of food by state agencies. Virginia (Chs. 9, 12 and 267) prohibits the carriage or storage of food under unsanitary conditions, and requires any commonwealth's attorney, on notice, to prosecute offenders under the "pure-food" and "feeding-stuffs" laws; and provides (Ch. 46) for the examination of oyster beds, the marking of polluted areas, and prohibits the taking of oysters therefrom.

Regulations for the sale of milk, the tests and content thereof, and the implements to be used are provided by Massachusetts (Ch. 134), New Jersey (Ch. 31), New York (Chs. 144 and 219) and Virginia (Chs. 437 and 454). Rhode Island, which previously excepted milk as a "food" under its pure-food statute, now includes it (Ch. 134). Maryland (Ch. 208) makes it a misdemeanor to sell a mixture of coffee and more than 15 per cent. of chicory. The mixture, if in packages, shall be labeled "coffee and chicory." If sold as a beverage, in hotels and restaurants, there shall be displayed a placard with the words "The coffee sold here is mixed with chicory." In Virginia (Ch. 18) oleomargarine must be sold in a way distinct from butter, and hotels, restaurants and eating houses which serve, and those who deal in, oleomargarine, must display large signs on their premises with words to that effect. Massachusetts (Ch. 189) standardizes vinegar, and (Ch. 58) provides a penalty falsely to label food receptacles with the word "Kosher" and to misrepresent that food conforms with orthodox Hebrew requirements.

Prohibition.—All of the southern states which had legislative sessions passed comprehensive and drastic prohibition laws, forbidding the manufacture, sale or advertising of liquor for sale, and the keeping of it except in limited amounts: see Georgia (special session, Nos. 2 and 3); Kentucky (Ch. 14); Louisiana (Ch. 14 and 113); Mississippi (Chs. 103 and 104); South Carolina (Ch. 538); and Virginia (Chs. 146 and 487). (See also *Criminal Law, infra;* VI, *Amendments to State Constitutions;* and XV, *The Liquor Problem.*)

Business.—Maryland (Ch. 175) enacts the Uniform Partnership Act, and (Ch. 596) revises its Corporation law; New Jersey (Ch. 191), the Uniform Transfer of Stock Act; and Mississippi (Ch. 244), the Uniform Bills and Note Act. Kentucky (Ch. 17) defines a trust or monopoly and prohibits from making understandings in restraint of trade.

Massachusetts (Ch. 289) imposes a penalty on anyone who, in front of a retail store, makes a practice of inducing or trying to induce others to purchase at any other similar store. Kentucky (Ch. 97), Massachusetts (Ch. 149) and Virginia (Ch. 42) prohibit the making of sales by means of false advertisements. New Jersey (Ch. 181) requires that containers of food must have the net contents marked on the container, but small packages may be exempted by the state superintendent of weights and measures.

Massachusetts (Ch. 129) permits trust companies, and Virginia (Ch. 298) permits banks to issue letters of credit. Mississippi (Ch. 120) makes it a misdemeanor to give an overdraft of $25 and a felony if over $25. Tennessee (Ch. 185) prohibits tips to any employee in a hotel, restaurant, dining or railroad car. (See also XIII, *The Conduct of Business;* and XIV, *Banking and Currency.*)

There have been a large number of enactments regarding insurance which it is not possible to summarize within the limits of this review. It must be noted, however, that Kentucky (Ch. 19) appoints a state fire marshal, who shall, among other duties, cause "fire prevention to be taught in all public and private schools" and

develop a system for preventing fire waste. New Jersey (Ch. 87) and Massachusetts (Ch. 32) authorize insurance against loss by banks of securities, deeds and money not in transportation. Virginia (Ch. 99) makes the suicide of the insured no defense unless expressly provided for in the policy, or where he intended suicide when he applied for the policy and carried out this intention. (See also XIV, *Insurance;* and XVI, *Labor Legislation.*)

In the interest of health and morals or as a protection from fraud and damage to property, Maryland (Ch. 704) enacts a comprehensive amendment to its licensing law and requires substantial payments before engaging in business by detective agencies, moving-picture shows, garages, dealers in cash registers, adding machines and typewriters, junk dealers, laundries, check rooms (in this case the fee is from $40 to $20, according as the charge per article checked is 10 cents or less), cleaning, dyeing and pressing companies, shoe-shining and hat-cleaning places, and restaurants or other places for eating. New York (Ch. 262) requires massage rooms to be licensed. Virginia (Ch. 77) requires that all commission merchants of farm products must be registered and licensed and give a bond of $2,000 to secure an accounting with consignors of farm produce; licenses may be revoked for false or improper charges for handling goods, or for a failure to account, or false statements as to market conditions, or where there has been a combination to fix prices.

Parent and Child.—Rhode Island (Ch. 1197) requires the adopter to be older than the adopted. Virginia (Ch. 417) regulates the relative rights of father and mother to the custody of their unmarried child. Maryland (Ch. 210) prohibits the separation of a child under six months of age from its mother, to be placed in a foster home or institution, unless for the physical good of mother or child. (See also *Criminal Law, infra.*)

Property.—Maryland (Ch. 325) revises the law of inheritance, and, as regards the descent of realty, assimilates it to the law of personalty. Massachusetts (Ch. 81) creates a commission to revise and codify the laws relating to the partition of real estate and the sale of real estate subject to remainders or executory devises; and (Ch. 108) provides that

> a contingent remainder shall take effect, notwithstanding any determination of the particular estate, in the same manner in which it would have taken effect if it had been an executory devise or a springing or shifting use, and shall, as well as such limitations, be subject to the rule respecting remoteness known as the rule against perpetuities, exclusively of any other supposed rule respecting limitations to successive generations or double possibilities.

Massachusetts also (Ch. 198) provides that deposits in savings banks unclaimed for more than 30 years, and for which no claimant is known, shall be transferred to the state, which may use them after six years, subject to the claim of the true owner. New Jersey (Ch. 123) permits the payment of checks, though the drawer has died, if presented within ten days after his death. New York (Ch. 313) provides for the apportionment of rents and annuities (see "Courts, etc.," *supra*).

The Torrens law was adopted or reënacted in New York (Ch. 547), South Carolina (No. 550), and Virginia (Ch. 62).

JUDICIAL DECISIONS[1]

CONSTITUTIONAL LAW

The Initiative and Referendum.—Under the system of the initiative and referendum as established in Washington, any legal voter may "propose" any measure to be submitted to the legislature or to the people, provided he conforms with certain requirements. A bill was proposed and the

[1] The number of decisions of all the courts of the United States for the period covered by this review is not far from 25,000. In the space available no attempt can be made to summarize more than a limited number of important decisions. Those selected have to do mainly with the every day concerns of the citizen and usually with the largest number of citizens.

question was raised as to whether the courts could restrain the proposer. The Supreme Court of Washington admitted that it had no power to interfere in the case of a member of the legislature no matter how arbitrary, how novel or foolish or unfair the proposed bill. But, the Court went on to say:

> We now have a duel system of legislation: One by a delegated, bicameral legislature; the other by the legal voters of the state in Massachusetts. Is the proponent of an initiative measure in any sense a legislator? Is the filing of a proposed bill or law a legislative step? Can the courts interfere?

In answer, the Court, however, being divided five judges to four, it was held that a voter who initiates a bill is not a legislator. He is merely given a license to exercise a legislative function in a prescribed manner. If he does not conform with the law as regards the procedure to be followed, he may be restrained by the courts at the request of other voters. The dissenting judges thought that this procedure was a step in the legislation and not subject to control or censorship by the courts. The bill in question had a preamble which was the main point of criticism by the petitioners who sought to restrain the progress of the bill, and it was also held by the majority of the court that a preamble is not an essential part of a statute. (State *v.* Superior Court, July, 1916, 159 Pac. Repr. 92.)

The Income Tax.—In Brushaber *v.* Union Pacific R. R. Co. (January, 1916; 240 U. S. 1) the U. S. Supreme Court sustained the Federal income-tax law of 1913. It is not unconstitutional as violative of the Sixteenth Amendment, nor under the due-process provisions of the Fifth Amendment, nor does it deny due process of law, nor equal protection of the law by reason of the classification of persons and things subject to the tax.

Foreign Commerce.— In Weber *v.* Freed (U. S. Supreme Court, December, 1915; 239 U. S. 325), plaintiff brought from Cuba to the port of Newark, N. J., moving-picture films of the Willard-Johnson prize fight. The collector refused to admit them, and the Supreme Court sustained his action. The collector acted under the law of July 31, 1912, making it unlawful to import any film or other pictorial representation of a prize fight. Congress has complete power over foreign commerce and authority to prohibit the introduction of foreign articles.

Property Rights in Labor.—By a Massachusetts act of 1914 (Ch. 778), entitled "An Act to make lawful certain agreements between employers and laborers, and to limit the issuing of injunctions in certain cases," it is provided that: "In construing this Act, the right to enter into the relation of employer and employee, to change that relation . . . or to do work and labor as an employee shall be held and construed to be a personal and not a property right," and it prohibited granting an injunction to enforce such right where no irreparable damage to property was threatened. The Supreme Judicial Court of Massachusetts declared this act to be unconstitutional. The right to work is property and one cannot be deprived of this by legislative enactment (Bogni *v.* Perotti, May, 1916; 224 Mass. 152.)

Full Crews.—The statute of Arkansas requiring full switching crews on railroads more than 100 miles in length is constitutional, and does not violate the due-process and equality clauses of the Fourteenth Amendment, nor interfere with interstate commerce. (St. Louis & Iron Mountain Ry. *v.* Arkansas, U. S. Supreme Court, April, 1916; 240 U. S. 518.)

Non-Residents' License to Fish.—Section 14, Chapter 6877, Acts of 1915 of Florida, providing that aliens or non-residents who shall take fish or oysters from the salt waters of the state, for any purpose other than the taker's individual use, shall pay a license tax, is constitutional. It is merely an attempt justly to discriminate as regards the common property of the state between its citizens and aliens. The latter do not have an equal right with the former to participate in the common property and privileges of the citizens of the state. (*Ex parte* Gilletti, Supreme Court of Florida, Dec. 8, 1915; 70 Fla. 442.)

Regulation of Charities.—An ordinance of the city council of Los Angeles creating a commission with power to control all charities and to forbid any person from soliciting funds

for charity without regard to his personal worth or fitness, is unconstitutional. Such a provision is not a reasonable regulation, and is in excess of its power to prevent unscrupulous persons from getting money or other things under pretense that they are to be used for charity. (*Ex parte* Dart, Supreme Court of California, February, 1916; 155 Pac. Repr. 63.)

Police Power.—The dividing line between restrictions upon the use of real property which may be lawfully imposed under the police power and those which are unlawful because they deprive the owner of property without compensation, or without due process of law, are not yet defined with precision. A case which seems to be unique was decided by the Supreme Court of Minnesota. The City Council of Minneapolis passed an ordinance creating a residential district, and prohibited stores, public garages or any business within the district. The Court held, two judges dissenting, that the ordinance restrained the owner from a use of his property not injurious to the public or to his neighbors, that it was not within the police power as regards the prohibition of stores, and was unconstitutional to that extent at least. (State *v.* Houghton, July, 1916; 158 N. W. Repr. 1017.)

An ordinance of the city of Richmond required an applicant for a license to operate a "jitney," to state in his application that he owned the vehicle he proposed to operate. This provision, the court decided, is unconstitutional, being unreasonable, and not tending to promote the safety or convenience of the public. (Parish *v.* Richmond, Supreme Court of Appeals of Virginia, June 8, 1916; 89 S. E. Repr. 102.)

Foods and Drugs.—By a Michigan statute it is provided that it shall be unlawful to sell adulterated sausages, defined to be comminuted meat with added salt and spices and containing no more water than the meat has in its fresh condition. Sausage shall be deemed to be adulterated if it contains water in excess of the above limitation, or if it contains any cereal. But sausage may be sold with cereal up to two per cent. if noted on the label or product. In the case of People *v.* Dehn before the Michigan Supreme Court (January, 1916, 155 N. W. 144), defendant had sold sausage containing more than six per cent. of cereal, for 15 cents per pound. The cereal cost three or four cents per pound and would absorb from one to two pounds of water. His conviction was sustained, and the Act held within the police power, although the sausage as sold was not harmful to health, as it was a fraud upon its purchaser.

By statute in Oregon every dealer in food in which eggs imported into Oregon from a foreign country are an ingredient, must display in his salesroom a sign bearing the words "Imported Eggs Used Here." There were similar provisions as to the sale of eggs. In the case of State *v.* Jacobson (June, 1916, 157 Pac. 1108), the defendant had been convicted of a violation of the statute, and on appeal the Supreme Court of Oregon held the statute unconstitutional, being an invasion of the powers of Congress to regulate commerce with foreign nations. The fact that the quality, condition or purity of the article of food was not the result aimed at by the Act showed, the Court thought, that it was not designed to protect the health of the citizens of the state, and hence, was not within the police power.

In People *v.* Swift Co. (Court of Special Sessions, Yonkers, New York, *N. Y. Law Jour.*, Sept. 8, 1916), complaint was made by the sealer of weights and measures that the defendant sold a "Premium" ham weighing 11¾ pounds in a container weighing six ounces, at its gross weight, instead of its net weight without the container, in violation of the General Business Act of New York, Art. 2, and rules 8 and 13 of the general regulations made by the state superintendent of weights and measures. Judgment was entered for the complainant.

(Seven Cases *v.* United States, U. S. Supreme Court, January, 1916; 36 Sup. Ct. Repr. 190.) The amendment of Aug. 23, 1912, to the Pure Food and Drugs Act of 1906, providing that the term "misbranded" should apply to drugs "if its package or label shall bear or contain any statement . . . regarding the curative or therapeutic effect of such article . . . which is

false and fraudulent," was attacked on the ground that it entered the domain of speculation, and, by virtue of consequent uncertainty, operates, when the drugs are confiscated, as a deprivation of property without due process of law. The drugs in question were accompanied by a statement that they were "effective as a preventative for pneumonia. We know it has cured and that it has and will cure tuberculosis." It was claimed that the owner has the right to give his views regarding the effect of his drugs. The Court holds that

> Congress recognized that there was a wide field in which assertions as to curative effects are in no sense honest expressions of opinion, but constitute absolute falsehoods, and in the nature of the case can be deemed to have been made only with fraudulent purpose. The amendment applies to this field and we have no doubt of its validity.

Billboards.—State *v.* Murphy (Supreme Court of Errors of Connecticut, July, 1916; 98 Att. Repr. 343) was an information against the defendant for displaying upon real estate an advertisement containing more than four square feet of surface without a license, in accordance with Chapter 314 of the Acts of 1915. The Court sustained the Act, on the ground that it was a revenue-producing and not a regulatory measure adopted for æsthetic or other reasons in the exercise of the police power. Moreover the taxation of signs is a lawful mode of taxing business.

By Section 152 of the New Jersey Crimes Act it is a misdemeanor to "paint or print upon, or in any manner place upon or affix to any of the steep rocks called the Palisades on the Hudson River," any advertisement. This was held to be unconstitutional, as the defendant's sign did not endanger public safety or affect the health or morals of the community. (State *v.* Lamb, Supreme Court of New Jersey, June, 1916; 98 Att. Repr. 459.)

Religious Exercises in Schools.—In state *v.* District Board (Supreme Court of Wisconsin, February, 1916; 162 Wis. 482), the defendant, a district school board, held the graduating exercises of a high school in a Catholic or a Protestant church, and prayers were offered by Catholic or Protestant ministers. The plaintiff sought to restrain this practice, relying on a provision of the Wisconsin constitution prohibiting sectarian instruction in the schools. The Court denied that such graduating exercises were sectarian instruction or that the use of a church for such exercises was "an interference with the rights of conscience" of the plaintiff.

COURTS

Comity.—A Massachusetts statute provided for the recovery of compensation up to $10,000 for death occasioned by negligence. A, a resident of New York, was killed in Massachusetts, and his personal representative brought an action in New York. The New York Supreme Court held (December, 1915, 92 Miscl. 475) that the Massachusetts statute, being similar in principle to a New York statute, an action could be maintained. On appeal this was reversed by a divided court, on the ground that the Massachusetts statute was penal, and also not compensatory but at variance with the law of New York. (Loucks *v.* Standard Oil Co., April 19, 1916; 172 Ap. Div. 227.)

Hanlon *v.* Leyland & Co., Ltd. (Supreme Judicial Court of Massachusetts, March, 1916; 223 Mass. 438), the plaintiff, as administratrix, brought action in Massachusetts for the death of her intestate husband caused by the negligence of the defendant in a foreign country. Her right was founded on Lord Campbell's Act. The defendant demurred, and the judge of the lower court overruled the demurrer. The Supreme Court sustained this ruling, saying: "Whatever rights the plaintiff may have acquired under the English statute, she should be permitted by comity to enforce in our courts in accordance with the trend of modern decisions."

Opinions by Divided Court.—In the course of the opinion in Matthews *v.* Clark (Supreme Court of South Carolina, June, 1916; 89 S. E. Repr. 471), the Court said:

> A dissenting opinion shows that the case has been thoroughly considered. The opinions of the majority govern. When that question arises in future cases, the dissenting justice is as much bound by

the decision of the majority as is the justice who wrote the prevailing opinion. The dissenting opinion within the jurisdiction of the court strengthens the authority of the case. Outside of the jurisdiction of the court, where the decision is not binding but merely evidence of what the law is, of course the conflict of witnesses weakens the force of the opinion.

Trial by Jury.—In Chilton *v.* Commonwealth (Court of Appeals of Kentucky, May, 1916; 186 S. W. Repr. 191), during the trial of the defendant for murder the sheriff took the jury to a revival meeting, where they were given front seats and the preacher discoursed on sin and its punishment. It was urged as ground for a new trial that the sermon showed that God approved of punishment, and this was an inducement to the jury to follow the divine example. The Court, however, held a mere theoretical discussion of sin and its punishment, considered solely from the angle of divine government, could not be prejudicial to the substantial rights of the defendant, and denied defendant's motion.

Moot Cases.—In United States *v.* Hamburg-American Co. (U. S. Supreme Court, January, 1916; 239 U. S. 466), the defendant, with others, had been charged with violating the Sherman Anti-Trust Act (216 Fed. 971). Pending the decision of an appeal to the U. S. Supreme Court, the war in Europe developed, and the questions in the case became moot. The Court took judicial notice of the existence of the war, and refused to decide the questions, although urged to on the ground that after the war the illegal combination would be resumed, but directed the court below to dismiss the bill without prejudice to the right of the Government in the future to assail any violation of the Act.

For the same reason, in Delavan *v.* N. Y., N. H. & H. R. R. Co. (New York Court of Appeals, Dec. 7, 1915; 216 N. Y. 359), the Court said: "When the question presented upon an appeal has by lapse of time and the changed course of events become academic merely, the court will ordinarily refuse to decide the abstract question and will dismiss the appeal."

Equity Jurisdiction.—A court of equity will not usually order a defendant to enter into a contract, but may decree specific performance of a contract that has been made. But a court of equity having ordered plaintiff to indorse certain drafts and on his refusal, committed him for contempt, it was held on appeal that the order was not lawful and that the court had no power to punish as for contempt. (*In re* Ziegenhein, St. Louis Court of Appeals, July, 1916; 187 S. W. Repr. 893.)

In the case of Willis *v.* O'Connell (Fed. Dist. Ct., Ala., April, 1916; 231 Fed. 1004), plaintiff, who was exclusive distributing agent of a proprietary medicine, asked that defendant, who published a paper, be restrained from publishing any article of a libelous character regarding the medicine, or the plaintiff or those who had given or might give testimonials as to its curative effects. The court dismissed the bill, declaring that it was the settled law in the United States that a court of chancery would not restrain a libel of person or property, nor undertake a censorship of the press, but would leave the parties to their remedy at common law and before a jury.

ELECTIONS

Free Elections.—In Neeley *v.* Farr (Supreme Court of Colorado, July 3, 1916; 158 Pac. Repr. 458), the struggle between labor and capital in the Colorado coal-mining industry came before the court in connection with a contest over the election of sheriff for the county in which certain corporations engaged in coal mining were located. The contestant alleged and it appeared that since the strike of 1913, and after the interference of the militia, areas about the mining property were fenced and called "closed camps" (*A. Y. B.*, 1914, p. 417; 1915, p. 435). They were justified by the corporations as means of safeguarding their property and the lives of the workmen. Under these conditions, in July, 1914, the board of county commissioners changed certain of the election precincts so as to constitute each of such camps an election precinct, and with but one exception, where a few ranches were included, the boundaries of these precincts were made to conform with the fences and lines around each camp, protected by fences in

some instances and by armed guards in all cases; that is, the precincts were on the private grounds and under the private control of coal corporations. Every officer of election, with a single exception and he was a saloon keeper and partner of the sheriff, was an employee of the coal companies. The polling places were within their buildings. The registration lists were kept and used by them as their private property. Many of the voters could not read. The ballots were so printed that the first letter of the names of the political parties was in unusually large type. The companies provided illiterate voters with a card on which was printed a large capital "R," corresponding with the letter "R" on the ballot in the word "Republican." It was so made that it could be slipped down the ballot and when the "R"s coincided in the proper space a cross could be placed. Under these conditions the Republican candidate was elected. The court held that his election was invalid, it not being "free and open." The counsel for the sheriff claimed that the conduct of the companies was justified on the ground of "industrial necessity." The court said that if the "closed camps" were proper for that reason, it ceased to be a justification when the territory had become dedicated to a public use such as voting. (See also XVI, *Labor.*)

Voting Residence.—*In re* Rooney (New York Supreme Court, May, 1916; 172 App. Div. 274) plaintiff resided with his family where he had a saloon and registered as a voter there. He removed his family to another voting district and resided with them there for 16 years. He continued to register and vote as from the saloon where he occasionally slept. The Court held:

> The mere fact that he considered it desirable for political purposes to continue to register and vote from that point did not make him a resident of the saloon within the letter or the intent of the constitution and laws of this state as applied to the elective franchise. . . . He cannot actually live in one locality for the sake of the comfort, convenience and social standing of his family, and maintain a wholly distinct political residence in a saloon or other place.

Corrupt Practices.—A candidate for election to a judicial position in Ohio announced that if elected he would not accept a portion of his salary. He was elected. The validity of the election was contested, and the Court of Appeals of Ohio declared the election invalid and that the candidate had no title to the office. The Supreme Court affirmed the decision of the Court of Appeals. (Prentiss *v.* Dittmer, Supreme Court of Ohio, January, 1916; 112 N. E. Repr. 1021.)

STATUS

Domicile of Husband and Wife.—A, the son of an officer in the U. S. Army domiciled in Louisiana, himself became an army officer. While stationed in Virginia he married B in New York, which was B's place of residence, and they lived together in New York for 12 years. A was assigned to a post in Oregon, and B refused to follow him there. A retired from the army after 30-years' continuous service, returned to Louisiana, and brought an action for a divorce against B. The District Court held that the abandonment was in New York, and that as B had never been in Louisiana, the court had no jurisdiction. But the Supreme Court of Louisiana, after affirming this holding on a rehearing, held that the domicile of origin of A in Louisiana, he being a soldier, continued during his period of service; that on her marriage B's domicile was in Louisiana, although she never was in the state, and that A was entitled to a judgment for a divorce which was binding in Louisiana and should be binding in other jurisdictions. (Stevens *v.* Allen, May, 1916, 71 So. Repr. 936.)

Community of Property.—Under the community system in vogue in the West and Southwest, community personal property belongs as much to the wife as to the husband, but he has the power to sell it. Presumptively the personal property they acquire after marriage is as much due to her as to him. In the case of Marston *v.* Rice (July, 1916, 159 Pac. Repr. 111), this principle was applied to an automobile, which the husband had bought after separation from his wife and given to his mistress. Her performances in the car became intolerable to the wife and she took it from the

garage and sold it to defendant, not out of necessity for money, but from an assertion of right. In a suit by the husband to recover the car from the wife's vendee the Supreme Court of Washington held that as against the wife the husband could not give the car away and refused to order its return to him.

Division of Property on Divorce.—In Judd *v.* Judd (Supreme Court of Michigan, July, 1916; 158 N. W. Repr. 948), a husband, being obliged to change his domicile because of his health, told his wife it might be best to divide his property and live separately. She replied she did not wish a divorce, and he, deceived by her as to her intentions, conveyed to her all his property. She then divorced him. The Court, as a court of equity, decreed an equitable division of the property.

Parent and Child.—Tidd *v.* Skinner (Supreme Court of New York, January, 1916; 156 N. Y. Sup. 885) was an action by the mother of a minor son against a firm of druggists for selling heroin to him. It was shown in evidence that the son was industrious and dutiful, and earning from $12 to $25 per week, but having become an habitual user of the drug, lost his health, his mind became impaired, and plaintiff lost his services. There was a verdict of $2,000 compensatory damages and $1,000 punitive damages. Both were sustained on appeal. The novelty of the action did not affect the principle on which the cause of action was based.

Involuntary Servitude.—In Butler *v.* Perry (U. S. Supreme Court, February, 1916; 240 U. S. 328), plaintiff, having refused to work on the roads when summoned by the proper officials, was sentenced to jail. The lower court sustained these proceedings (67 Fla. 405) and the U. S. Supreme Court affirmed this judgment. It was contended that the statute under which the sentence was made was invalid because it imposed involuntary servitude. The Court denied this and said:

> A state has inherent power to require every able-bodied man within its jurisdiction to labor for a reasonable time on public roads near his residence without direct compensation. This is part of the duty which he owes to the public.

PROPERTY AND CONTRACTS

Trusts.—A gave the residue of his estate to X in trust for B, "free from the interference or control of his creditors." This was treated as giving B an equitable fee, and it was held to be beyond the reach of his creditors. (Boston Safe Deposit & Trust Co. *v.* Collier, Supreme Judicial Court of Massachusetts, January, 1916; 222 Mass. 390.)

In McColgan *v.* Magee (Supreme Court of California, February, 1916; 155 Pac. Repr. 995), the court, while recognizing the validity of such trusts in California, refused to exempt the fund from liability for the debts of one who had imposed the restriction on his own property.

Charities.—If the purpose of the donor of property in trust for charity is so vague as to be incapable of execution or supervision by a court the trust will fail. A testatrix bequeathed her property to trustees for "the furtherance of the broadest interpretation of metaphysical thought, in whatsoever manner and by whatsoever means they may jointly consider proper and best." The Court of Chancery of New Jersey, in the case of Vineland Trust Co. *v.* Westendorf (July, 1916, 98 Atl. Repr. 314), sustained this legacy, holding that the purpose of the trust was teaching metaphysics, an educational trust; and the beneficiaries were all mankind, a general trust, the trustees having the power to make it definite.

In re McDowell (Supreme Court of New York, Appellate Division, Dec. 17, 1915; 170 App. Div. 245) a testatrix conveyed all her property to trustees, for a home for refined gentlewomen of small means, "whose home is made unhappy by having to live with relatives who think them in the way," giving the preference of being inmates of the home to certain specified relatives and their descendants. The court declared this trust to be invalid. It was not a public charity, but so framed as to be a gift to the trustees in perpetuity for certain named individuals and was therefore void.

Transfer Taxes.—A devised realty to B for life with power to appoint by deed or will to his issue or to his sis-

ters or their issue. B conveyed his life estate to and executed the power in favor of his sisters, by deed of Jan. 23, 1911, and died intestate on Nov. 30, 1914. By Section 220 of the New York Transfer Tax Act, "whenever any person shall exercise a power of appointment, such appointment shall be deemed a transfer taxable in the same manner as though the property to which such appointment relates belonged absolutely to the donee of such power, and had been bequeathed or devised by such donee by will." The court held that a transfer tax was payable based on the value of the property on Jan. 23, 1911. (*In re* Wendell, Surrogate's Court, May, 1916; 95 N. Y. Miscel. 406.)

Inheritance Taxes.—The case of McDougald *v.* Boyd (Supreme Court of California, June, 1916; 159 Pac. Repr. 168) dealt with the liability of a joint deposit in a savings bank to an inheritance tax. A and B were husband and wife. A opened two accounts in a bank, they and the bank agreeing that the amount on deposit should be payable to A and B or either during their joint lives, and should belong absolutely to the survivor. When A died there was about $38,000 on deposit. The county treasurer claimed an inheritance tax. B contested this claim and the court decided in her favor, saying that B did not take as heir or successor to her husband but possessed an interest in joint tenancy originating at the time of deposit.

Non-Performance of Contract.—In Mineral Park Land Co. *v.* Howard (Supreme Court of California, March, 1916; 156 Pac. Repr. 458), the defendant contracted to take from the plaintiff's land all the gravel necessary in making a bridge, estimated at 114,000 yds., and agreed to pay five cents per yard. Defendant removed about 50,000 yds. and secured the balance elsewhere. To an action for damages for failure to perform, the defendant pleaded in excuse that the gravel not removed was below water level and removable only at an expense ten times the usual cost. It was shown that there was abundance of gravel below water-level. The trial court found for plaintiff, on the ground that where one has agreed without qualification to do a possible act, he is not excused from non-performance because of difficulty of performance. The Supreme Court held that if the agreement to do something involves the existence of the subject matter, which turns out to be non-existent, performance is excused, and "where the difference in cost is so great as here, and has the effect, as found, of making performance impracticable, the situation is not different from that of a total absence of earth and gravel."

Sales.—In Penser *v.* Marsh (New York Court of Appeals, July, 1916; 113 N. E. Repr. 494) is a decision as to the right of a conditional vendee of a chattel to deduct from the purchase price what he thinks is a just amount for the violation of a warranty. A sold B a piano, stool and scarf, title not to vest in B until she had paid $260, of which there was part payment, the balance to be paid in equal monthly payments. B paid $119. A then brought replevin to recover the articles sold. B claimed there had been a breach of warranty by A, and that by the Uniform Sales Act (Sec. 150) she could "accept the goods and set up against the seller the breach of warranty in diminution or extinction of the price." This claim was sustained by the Court, and the same case in the court below was affirmed (167 App. Div. 604).

In McPherson *v.* Buick Motor Co. (Court of Appeals of New York, March, 1916; 217 N. Y. 382), the defendant was a manufacturer of automobiles. He sold an automobile to a retail dealer. The retail dealer resold to the plaintiff. One of the wheels was defective. It was not made by the defendant, but was bought from another manufacturer. Its defects were discoverable by reasonable inspection, but that inspection was omitted. There was no claim that the defendant knew of the defect and willfully concealed it. He was not charged with fraud but with negligence. The question to be determined was whether the defendant owed a duty of care and vigilance to anyone but the immediate purchaser. The Court answered the question in the affirmative, holding him liable to

the plaintiff on the ground of the inherently dangerous character of automobiles which must be used without inspection by the buyer, and in its use exposes him to peril.

In Rinaldi *v.* Mohican Co. (Supreme Court of New York, Appellate Division, March, 1916; 171 App. Div. 814) plaintiff became infected with trichinae in pork which she ate and which she had bought of defendant, a retail dealer. The meat appeared good, and bore the U. S. Government stamp to the effect that it was sound. A judgment by the trial court for the plaintiff was affirmed by the Appellate Division on the ground that the ancient rule that there was an implied warranty on the part of the vendor of foodstuffs sold for immediate consumption as wholesome, is in force in New York, although the Court expressed its belief that this doctrine is no longer suitable to modern conditions, and implied that as the dealer in the case was absolutely free from negligence, he should not have been made liable. But he was held liable nevertheless on the implied warranty.

In Greenwood Cafe *v.* Lovinggood (Supreme Court of Alabama, May, 1916; 72 So. Repr. 354) complaint was made that the defendant sold tainted food, that it was eaten by the plaintiff and made him sick. Judgment for plaintiff was affirmed. The Supreme Court ruled that the keeper of a café engaged in the business of serving food to customers is liable if by his negligence food is served which causes sickness. It also held that the testimony of one who ate of the food with the plaintiff was evidence that could go to the jury in corroboration of plaintiff's testimony.

Carriers.—A bought a ticket from X to Y and went to Y but left his luggage at X. The next day at his request the railroad company by which he travelled forwarded his luggage from X to Y, and in transit a suit of clothes was lost. What was the liability of the company—that of carrier or that of a gratuitous bailee? In the former case it would be liable, in the latter only on proof of "gross negligence." In Perry *v.* Seaboard Air Line Ry. Co. (Supreme Court of North Carolina, March, 1916; 88 S. E. Repr. 156) it was decided that a railroad is not a carrier of a passenger's baggage unless it goes with him on the same train, or the company fails to send it by its own act, or sends it by another train or line.

The case of the New York, Philadelphia & Norfolk R. R. Co. *v.* Peninsula Produce Exchange (U. S. Supreme Court, Jan. 24, 1916) raised the question: "Does the Carmack Amendment impose on the 'initial carrier' liability for delay occurring on the line of its connection without physical damage to the property?" The Produce Exchange had delivered to the railroad at Marion, Md., a carload of strawberries for transportation to New York City. The berries should have arrived in New York Friday night in time for the one o'clock a. m. Saturday market. They could then have been sold to advantage, but not arriving until the market was over, had to be sold at a loss. The berries were not injured, but plaintiff by reason of the delay suffered "the loss of the market." The Court of Appeals had affirmed a judgment of the trial court in favor of the shipper. The United States Supreme Court affirmed this judgment.

Innkeepers.—The case of Parker *v.* Dixon (Supreme Court of Minnesota, April 20, 1916; 1579 N. W. Repr. 583) raises the question: When does the responsibility of an innkeeper for a guest's property begin? The plaintiff, a travelling salesman, on alighting from the train at a station, handed his luggage to a colored porter, who was there for the purpose of carrying the hand luggage of prospective guests from the station to defendant's hotel. The luggage was taken to the hotel and was put with other luggage on the floor of the hotel lobby. Plaintiff did not expect to go to the hotel, attended to his business during the day, later went to the hotel and used its telephone and writing room, and registered at ten o'clock. His luggage could not be found. He brought an action to recover for its loss. The court held that while the relation of guest and innkeeper might have begun at the station platform, it did not in the case in question as there was then no intention on plaintiff's part that it should.

MASTER AND SERVANT

Employers' Liability.—*In re* Murphy (Supreme Judicial Court of Massachusetts, June 29, 1916; 113 N. E. Repr. 283) the question was raised: What is the nature of the right to compensation under the Workmen's Compensation Act of Massachusetts? In this case an employee had been killed and an award of $9.50 a week for 300 weeks had been made to his mother, an invalid, and at the time of his death his sole next-of-kin. She died and the board directed that the payment should be made to her administrator to be paid to the employee's next-of-kin. The mother left two sickly and dependent children. The question was whether she had acquired a vested and transmissible right to the sum awarded, so that the invalid children could have the benefit of it. It was held that to give them the benefit would be to impose an obligation on the employer not contemplated by the Act.

The Connecticut Workmen's Compensation Act gives compensation for "personal injury" arising out of the employment. In Miller *v.* American Steel and Wire Co. (Supreme Court of Errors of Connecticut, April, 1916; 97 Att. 345), plaintiff worked in a room containing lead fumes from which he contracted lead poisoning. This was held to be an industrial or occupational "disease" for which the Act provided no remedy. The case contains a discussion of the various state acts, with reference to this group of cases.

In Rist *v.* Larkin & Sangster (Supreme Court of New York, Appellate Division, January, 1916; 156 N. Y. Supp. 875), while operating a crane and to save himself from part of it which broke, claimant jumped into a river and, from the wetting which resulted, contracted tuberculosis. Compensation was awarded. On appeal the Court held that the jumping was not voluntary but was the result of the accident to the crane and claimant's getting wet was accidental and as if he had been thrown into the water by the breaking of the crane, and the disease was the natural result. The award was sustained.

A was peculiarly ticklish, and was known to be by the other employees of B. While going down stairs with a filled bucket A was tickled by a fellow employee, and fell, causing an injury for which he claimed compensation of his employer. The Industrial Commission of California made an award in his favor. The Supreme Court held that this was error. The injury did not "arise out of" the employment. (Coronado Beach Co. *v.* Pillsbury, Supreme Court of California, June, 1916; 158 Pac. Repr. 212.)

In re Dale *v.* Saunders and the Standard Insurance Co. (Supreme Court of New York, Appellate Division, March 8, 1916, 171 App. Div. 528; affirmed New York Court of Appeals, April 25, 1916, 218 N. Y. 59) the right of a "lent servant" to recover compensation from either employer is considered. A was a driver in the employ of B, a brick manufacturer. Occasionally B furnished teams and drivers to C, who owned a sand bank, for the purpose of carting sand to C's customers. While loading sand on a wagon at the sand bank A was killed by falling sand. B paid A $2 per day, and C paid B $5.50 per day for the team and his services as driver. Both employments were hazardous. The Appellate Division held that either B or C would be liable. The Court of Appeals affirmed this as regards B, holding that he was the employer within the Workmen's Compensation Act.

Where A works for B and is injured by C, under the provision of Section 29 of the New York Workmen's Compensation Act, A may elect to sue B or C but cannot have an action against both. (Leslie *v.* Otis Elevator Co., New York Supreme Court, Appellate Division, November, 1915; 169 App. Div. 613. Miller *v.* New York Railways Co., ibid., Jan., 1916; 171 App. Div. 316.) Accepting the construction of the Washington statute made by the Supreme Court of Washington in Peet *v.* Mills (76 Wash. 437), the Supreme Court of the United States held that if A while employed by B is injured by C, A's sole remedy is against B. The Court said: "It was the policy of the state to substitute a new remedy reaching every injury sustained by any workman while employed in such [hazardous] industry regardless of the cause of the injury

or the negligence to which it might be attributed." (Northern Pacific Railway Co. *v.* Meese, January, 1916; 36 Sup. Ct. Repr. 223.)

A, an injured workman in B's employ, was taken to C's hospital. C was employed to do surgical and hospital work for B and was paid out of a fund contributed to by A and other workmen. After leaving the hospital A received an award for his injuries under the Washington Industrial Insurance Act. Thereafter he brought an action against B and C for damages caused by C's malpractice. The Supreme Court of Washington, saying there was no case in point, decided that the plaintiff had no remedy outside that provided by the insurance law, and dismissed the action. That law "does not merely deny a right of action, but abolishes all civil actions and all civil causes of action to which he might have resorted, as well as the jurisdiction of the courts to entertain such causes." (Ross *v.* Erickson Co., February, 1916; 155 Pac. Repr. 153.)

Defendant manufactured macaroni. Its business was within the hazardous employments enumerated by the New York Workmen's Compensation Act. Defendant employed B, a carpenter, to make alterations in the building where its business was carried on, and while so employed he was killed. His personal representative obtained an award from the Commission but this was reversed by the New York Supreme Court, Appellate Division (November, 1915, 170 App. Div. 103) and this reversal was affirmed by the Court of Appeals (Barcey *v.* Massaro Macaroni Co., June, 1916; 218 N. Y. 410). The Court said:

> The company was an employer, because it employed workmen in an hazardous employment; B, the deceased, was not an employee, because he was not engaged in the preparation of macaroni. The plaintiff invokes also the part of the language creating group 42 as follows: "construction, repair and demolition of buildings." It is answered by the fact that the company did not carry on the occupation of constructing, repairing and demolishing buildings for pecuniary gain.

Nelson *v.* Illinois Central R. Co. (Supreme Court of Iowa, December, 1915) was an action by a father to recover damages for an injury to his minor son while in defendant's employ as brakeman on an interstate train. Defendant pleaded that the plaintiff has no cause of action because the Federal Employers' Liability Act has no provision for such a case; the remedies it affords are exclusive of other remedies and are confined to and enforceable only by the injured employee. It was held that the statute providing a new right did not impair the rights of third parties at common law, in the absence of intent to the contrary.

Discharge.—In Frachtman *v.* Fox (Supreme Court of New York, December, 1915; 156 N. Y. Supl. 313), plaintiff was employed by defendant, who gave him a set of cuff links at Christmas. Plaintiff returned them with a courteous letter, and for this sole cause was discharged before his time of employment expired. His action in the trial court for damages for wrongful dismissal from defendant's service was dismissed, but on appeal a new trial was ordered. "The acceptance of a gift or even an increase in compensation is not compelled by law. Where the relation exists it justifies only such social and sentimental manifestations on the part of the employer as the employee may willingly accept."

TORTS

False Arrest.—The proposition that the power to arrest without warrant, while in some cases useful to the public, is dangerous to the citizen, for it may be perverted to purposes of private malice or revenge, and ought not to be enlarged, is illustrated in the case of Witte *v.* Haben (Supreme Court of Minnesota, November, 1915; 131 Minn. 71). The defendant, a police officer, was advised by the chief of police that plaintiff was acting strangely, that there was some question of his sanity, and was instructed to arrest and detain him in jail until his sanity could be determined. Defendant arrested the plaintiff and the next day he was released. Plaintiff brought an action for false imprisonment and obtained a verdict. The Supreme Court of Minnesota sustained this verdict. To justify the arrest without a warrant it is not enough for the officer to show that he acted on reliable information and in good

faith. He must show insanity in fact and impending disturbance or danger.

Injury before Birth.—It has been decided in several cases that a child cannot maintain an action for injuries he claims to have received before his birth, as where he has been born a cripple, and there is evidence that a few days before his birth his mother was injured by the fall of an elevator. In the case of Phair *v.* Dumond (Supreme Court of Nebraska, February, 1916, 156 N. W. Repr. 637), it appears that B's mother died in 1911 as a result of injuries by her husband A while under the influence of liquor sold by defendant to A in 1908. B was born in 1910. A statute imposed liability on the liquor dealer to pay all damages in consequence of the sale of liquor. B brought an action against the liquor dealer to recover for loss of the mother's support; and was allowed to recover.

Another point of interest was decided. The liquor dealer sold to A two glasses of whiskey, but A stole other whiskey. The Court said: "Granted that the stolen whiskey completed the intoxication, it is clear that the liquor drunk in the saloon contributed to produce it," and sustained instructions to the jury that it was not material how A obtained the liquor that completed the intoxication.

Slander.—There are cases where one may have a grievance for which the courts of law will not provide a remedy. Such is the case of Carter *v.* Papineau (Supreme Court of Massachusetts, January, 1916; 222 Mass. 464). Plaintiff, a member of the Episcopal Church, alleged that she entered the church to partake of the communion but that defendant, the rector in charge, refused to administer it to her,

> whereby the plaintiff says that defendant has held her up to public disgrace, humiliation and shame, and has in effect represented that she was an open and notorious evil liver, and that she has done some wrong to her neighbors by word or deed so that the congregation has thereby been offended, and that she was an unfit person to enter and worship in said church.

For this the plaintiff claimed damages. The court held that plaintiff's religious rights as a communicant were not enforcible in the civil courts, and that there was no defamation although she suffered mental distress, and the omission was in the presence of the other communicants.

Mental Anguish.—The Federal District Court for the Southern District of California, in the case of Jones *v.* Western Union Telegraph Co. (June 5, 1916, 233 Fed. Repr. 301), repudiating the "Texas doctrine," so-called, held that damages can not be recovered for mere mental anguish unaccompanied by some injury to person or property.

In Southern Express Co. *v.* Byers (April 3, 1916, 240 Sup. Ct. Repr. 612), plaintiff sued to recover damages for mental anguish occasioned by the failure of defendant, an interstate express company, promptly to deliver a casket and grave clothes intended for his wife's burial. The U. S. Supreme Court held that there could be no recovery for mental anguish alone and unaccompanied by injury to the person or property, repudiating the so-called "Texas doctrine" to the contrary and overruling the Supreme Court of North Carolina which had affirmed a judgment of a trial court in favor of the plaintiff.

The Practice of Medicine.—By code in Washington it is provided that a Board of Medical Examiners may refuse to license or revoke the license of a physician guilty of unprofessional conduct, which among other things, includes "all advertising of medical business which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons." The defendant advertised his ability to cure a long list of diseases, including Bright's disease, infantile paralysis "and most other so-called incurable diseases." The Board revoked his license. The Superior Court reversed this order. On appeal the Supreme Court of Washington held that the order of the Board should be affirmed. The Court said: "It is not merely unethical, but immoral to get money from the poor, the simple, or the ignorant, by advertising the cure of what is incurable, and the courts will call that incurable which the present stage of knowledge so pronounces." (State Board *v.* Jordan, July, 1916; 158 Pac. Repr. 982.)

One who maintains a place known

as the "Progressive Healing Institute," and after an examination of a patient and after assuring him that he treats patients by prayer only, proceeds to lay his hands on certain parts of the patient's body where his trouble is, and on the spine where are nerves controlling the organ affected, is practicing medicine and must have a license as provided by statute. (State *v.* Pratt, Supreme Court of Washington, July, 1916; 158 Pac. Repr. 981.)

In People *v.* Cole (New York Court of Appeals, Oct. 3, 1916), the defendant had been convicted of illegally practicing medicine by Christian-Science methods (*A. Y. B.*, 1914, p. 260). This question was certified to the Court of Appeals: "Is the commercialized use of prayer for the avowed purpose of treating all persons seeking cure for all kinds of bodily ills the practice of the religious tenets of the church?" The Court held that although the practice of healing by Christian Scientists would come within the definition of medical practice, yet as the statute specifically exempts those who in the treatment of bodily ills follow the tenents of any religion, Christian Scientist practitioners are not liable for illegally practicing medicine.

In State *v.* Fite (Supreme Court of Idaho, Oct. 9, 1916; 159 Pac. Repr. 1183), it is held that one who is a "chiropractor" and whose treatments consisted in the manipulation of the region of the patient's spinal column with his hands, who used no drugs and no instruments, and who did not hold himself out as a physician nor diagnose ailments, did not violate the Idaho act requiring a license by one who held himself out as a physician, and who prescribed for ailments "any drug, medicine, means or appliance" for relief or cure thereof.

Theatres.—Stamp *v.* Eighty-Sixth Street Amusement Co. (Supreme Court of New York, June, 1916; 159 N. Y. Supp. 683) was an action (apparently of tort) for damages to plaintiff's wife who was a spectator in defendant's theatre. After an act which was by trained lions, three of the lions escaped from their cage and entered the orchestra. In the panic caused in the audience the plaintiff's wife was injured. The defendant did not own the lions, but had procured the act and invited the public to see it. The trial justice dismissed the complaint on the ground that the defendant did not own the lions, did not have charge of them, and was not negligent. The Supreme Court reversed this judgment on the ground that by allowing the lions to be on his premises defendant became liable in any event, they being "vicious" animals.

In Cox *v.* Coulson (King's Bench Division, England, March, 1916; 85 L. Jour. Repr. 1080), plaintiff was a spectator, holding a ticket, in defendant's theatre. Defendant engaged a company to give a play. During the play an actor discharged a pistol supposed to have a blank cartridge, but in the barrel of which was, by accident, a metallic substance. This serving as a missile struck the plaintiff. The actor was not a servant of defendant, nor was he a partner with the manager of the company. The liability of defendant must be found in some implied contract. The trial judge held that defendant impliedly contracted that all members of the play should use due care and not expose the audience to danger. The Court of Appeal ordered a new trial and said that it is an implied term of the contract made with the buyer of a ticket, where the play has intrinsically dangerous incidents, that he will use due care to see that such incidents are performed without risk to the playgoer. But he is not liable for an accident which could not have been prevented by due care, but which happens through the negligence of some one of the players. He does not warrant that there shall be no such negligence, his liability being that of an inviter to an invitee.

Sunday Laws.—In Koelble *v.* Woods (Supreme Court of New York, 159 N. Y. Supp. 704), application was made to the Supreme Court of New York by the president of the Liberty Day Association for an injunction to restrain the police commissioner and others from interfering with a celebration on Sunday to consist of athletic contests to allow men of alien birth or stock to attest their Americanism in a manner most appropriate to them. It was held that

Section 2145 of the Penal Law, prohibiting all public sports, exercises or shows, upon the first day of the week, and all noise disturbing the peace of the day, applied, and the injunction was not issued. The Court said:

> This statute, except for a few minor changes, was passed in 1788, and it may be that since that time conditions have so changed that a vast majority of the people of this and other communities do not believe in the strict enforcement of the statute; but that is a matter for the legislature, and not for the courts. It is no argument against this statute to refer to it as a "blue law." As long as it remains on the statute books it should be enforced.

By the Penal Law of New York one may not labor on Sunday unless he uniformly keeps another day of the week as holy time and does not labor on that day, and unless he can show that the labor on Sunday does not disturb other persons in observing the day as holy time. Defendant observed Saturday as a holy day, and carried on his shoe factory on Sunday to the annoyance of his neighbors. The Supreme Court, Appellate Division, in People *v.* Adler (July, 1916, 160 N. Y. Supp. 539), sustained his conviction as a Sabbath breaker, on the ground that the statute permits only servile labor and is no defense to the offense of conducting manufactories on Sunday, prohibited by the Penal Law (Sec. 2146).

In Pulitzer Publishing Co. *v.* McNichols (Supreme Court of Missouri, December, 1915), plaintiff sued defendant for printing advertisements in the St. Louis *Post-Dispatch*, Sunday edition. Defendant denied liability on the ground that printing, mailing and delivering papers on Sunday was work prohibited and made unlawful by statute. The statute excepted works of necessity or charity. The Court held that the publication of the Sunday papers is a work of necessity. The Court among other things said:

> The great service the press is rendering to humanity is performed on Sunday as well as upon Monday or upon any other day of the week, and its beneficence is more potent on the former than on the latter for the simple reason that the toiling masses have more time to read the papers on Sunday than on any other day of the week.

Automobiles. — In Farthing *v.* Strouse (Supreme Court of New York, Appellate Division, May, 1916; 172 App. Div. 523), the Court answered the "perplexing question of the liability of the head of a family, who is the owner of a motor car, for a casualty resulting from its use and operation, for pleasure, by a member of his family who operates negligently." In this case the defendant's wife operated the car. He admitted she had his authority to use the car for "any purpose whatever." There was no evidence that she was engaged in his service, however. The Court held that he was not liable, there being no presumption from the relationship that she was in his service.

Animals.—In Heath's Garage, Limited, *v.* Hodges (K. B. Division, Court of Appeal, England, June, 1916; [1916] 2 K. B. 370), plaintiff, while operating his motor with due care on a highway, was overturned by hitting a sheep which suddenly jumped from a bank on the roadside. The sheep was defendant's and had escaped from his field through gaps in a defective hedge, which he neglected to keep in repair. Action was brought for damages. The Court, owing to its novelty and importance, gave the case very careful consideration, and decided that there was no duty on the defendant to keep his sheep from straying on the highway, and as sheep do not act viciously but only stupidly, he was not liable. *Prima facie*, as this regards, all domestic animals are harmless, and the motorist runs against them at his own risk.

Tasker *v.* Arey (Supreme Judicial Court of Maine, February, 1916; 96 Atl. Repr. 737) to the *contra*, is based on a statute of 1909 making dog owners liable for damages caused thereby.

Joint Tort Feasors.—If B and C each carries on a trade which pollutes the air to the damage of A, as a rule he cannot sue both in a joint action, there being no concerted action or community of interest between B and C, but must sue each separately, and has the burden of showing the proportion which each contributes to his injury. In a few jurisdictions A may sue B and C jointly, but the Court of Appeals of Georgia denies that he has such right if they acted independently. (Key *v.* Armour Fertilizer Works, July, 1916, 89 S. E. Repr. 593.)

Spite Fences.—In the case of Hibbard *v.* Halliday (Supreme Court of Oklahoma, June, 1916; 158 Pac. Repr. 1158), the parties were owners of adjoining city lots. Plaintiff had built an apartment house on his lot with one wall close to defendant's lot. Defendant then made a solid brick wall close to the boundary line. Plaintiff brought his action for damages, claiming $3,000 depreciation, and alleging that defendant had built the wall maliciously and solely to injure him. Defendant contended that his conduct was not actionable at law. The Court admitted that the authorities supported this view, but refused to admit the doctrine into the law of Oklahoma, and affirmed the judgment for the plaintiff in the court below.

Homicide.—In People *v.* Diamond defendants were indicted for manslaughter in the first degree, charged with the death of certain persons by burning through failure to comply with the labor law of New York (Sec. 94), which provides that the owner of a "tenant factory," whether he is occupant or not, shall be punishable if the doors are not unlocked during working hours. The New York Supreme Court (April, 1916, 95 Miscl. 114) lays down the rule that a factory owner may be guilty of manslaughter in the first degree. The doors being locked and the inmates burned to death, although he may not personally violate the law, and may not know of its violation by his agent.

THE EUROPEAN WAR

Military Enterprises.—What constitutes a "military expedition or enterprise," within the meaning of the U. S. Criminal Code, Act of March 4, 1909, Sec. 321, which imposes a penalty on whomever within the United States sets on foot any military expedition or enterprise against a foreign state at peace with the United States? Some courts have interpreted the term to require a high degree of military organization, drilled soldiers commanded by officers and equipped. In United States *v.* Tauscher (Fed. Dist. Ct., New York, June, 1916; 233 Fed. Repr. 597), one defendant arranged for five German subjects to meet, another was to provide explosives, all were to be provided with revolvers and ammunition, as well as bombs, and were to go to the Welland Canal in Canada for the purpose of destroying it. This was held to be within the statute.

> If there be a preconcerted plan of operations, with leadership, and a coördination of men and arms and munitions and other means for attacking the armies or navies of the belligerent, or crippling or destroying her military institutions, set on foot for the purpose and with the intention of so attacking the belligerent nation in either aspect, and thereby to render aid and assistance to the enemy, the military enterprise or expedition contemplated by the statute would seem to be complete.

Conspiracy in Restraint of Trade.—In United States *v.* Rintelen (Fed. Dist. Ct., New York, June 29, 1916; 233 Fed. Repr. 793), the defendants were indicted under the Sherman Act for entering into a conspiracy in restraint of trade. While the main question in the case was as to the sufficiency of the charge, the subject matter is worthy of notice. By way of inducement the indictment referred to the great number of concerns engaged in the manufacture and shipping of munitions of war to the Allies. It then charged the defendants with knowledge of this and that they had conspired to restrain this manufacturing and foreign commerce by organizing strikes, fomenting labor troubles and by other means, hindering the production and transportation of such munitions. This was held sufficiently to apprise the defendants of the nature of the charge, and that it was within the Sherman Act.

Alien Enemies.—A German citizen absent from Germany for 10 years consecutively loses his German nationality automatically, but may be renaturalized on his application without return to Germany, and if he return, is subject to service in the army. In *ex parte* Weber (In the English House of Lords, February, 1916; 85 L. J. Reps. 944), petitioner had been interned as an alien enemy. This was a petition of *habeas corpus*. On appeal it was denied, as the applicant, although a resident of England for more than 10 years, had not shown that the obligation on him to serve the German Empire in arms had been taken away. It was argued that he

had lost his German nationality, and had not acquired another, and was therefore "a man without a country." The Lord Chancellor refused to say anything upon "the question as to whether or no this country will recognize a man as having no nationality" as he did not think it arose in the case. Earl Loriburn, on the point, said: "Until a man acquires a nationality other than that of his birth, it may be that he has not divested himself of the nationality of his birth, and he cannot be a cosmopolitan."

In Newman *v.* Bradshaw (British Columbia Supreme Court, February, 1916, 28 D. L. R. 769), a German subject resident in the United States brought suit in a Canadian Court. A motion had been made to set aside the writ on the ground that the plaintiff was an alien enemy. The court said: "In such a case as this the presumption of desire to act upon his allegiance on the part of the alien enemy resident in a neutral country where this country has absolutely no control over his actions should preclude the King's Court from affording such an alien any assistance *flagrante bello*." The Court enlarged the motion to the trial, to which the plaintiff would proceed at his own risk.

In Distington Hematite Iron Co., Ltd., *v.* Possehl & Co. ([1916] 1 K. B. 811), the German defendants were the British plaintiff's agents for the sale of the plaintiffs' products on the Continent. As the agency was a continuing one and involved a continuous relation between the parties, it was held to be dissolved by the war.

CRIMINAL LAW

JOHN W. EDGERTON

Public Morals.—The year 1916 has not been an eventful or a markedly progressive year in criminal law. Laws in relation to sex morality and the protection of public health predominate in the legislation of the comparatively few state legislatures in session. New York (482) makes it a misdemeanor for one who is married to take out a license to marry another, so making mere "preparation" to commit bigamy a substantive offense; also (368) punishes an unauthorized person for solemnizing or presuming to solemnize any marriage between any parties with intent to deceive. Seduction "under pretense of marriage" in New York (196) is made an offense, extending the former statute which covered only seduction "under promise of marriage," probably a necessary amendment in view of the revelation of the methods of white-slavers and the doubtful state of the common law. Virginia (436) requires maternity hospitals and lying-in asylums and persons receiving and keeping children not relatives to be licensed and to report all deaths, admissions and discharges within 24 hours; and the placing-out within one month of a child so born is permitted only with the approval of the superintendent and the local health officer.

Kentucky (49) enacted an intrastate white-slave act punishing the transportation of a woman from one point in the state to another to become an inmate of a house of prostitution, the receipt of anything of value from the earnings of a prostitute without lawful consideration, and pandering, by a penalty of from one to five years in the penitentiary. Procuration or pandering is not a new offense, but the first two provisions of the statute doubtless cover acts that are not criminal standing alone. The Federal authorities unearthed a widespread scheme of using the Mann White-Slave Act in cases of private immorality for extortion and blackmailing by impersonation of Federal officers or agents. The question of whether the Act is limited to commercialized vice or was intended to include private immorality is now before the U. S. Supreme Court in a pending case.

Maryland (616) broadens her sexual-perversion statute, and Virginia (295) increases the punishment for the same offense. Virginia (463) and New Jersey declare a house of prostitution to be a nuisance and authorize a permanent injunction and the disuse of the building for one year, unless the court is satisfied of the owner's good faith, and a bond is filed. Incestuous fornication or adultery

(Georgia, 462), conducting gambling games and making testimony thereof compellable under grant of immunity (Virginia, 445), betting (Virginia, 44), bookmaking outside of the hippodrome (Porto Rico, 41), holding popularity contests for a prize (Georgia, 470), regulating the hours for billiard parlors and excluding minors under 14 (Maryland, 140, 205), and a board of censors for motion pictures (Maryland, 209), are some of the other statutory provisions looking to the protection of public morals. Liquor-law violators are sentenced to imprisonment with hard labor in South Carolina (390) and Virginia (146); advertising of intoxicating liquors is forbidden in Mississippi (104) and Virginia (146), and in South Carolina (538), the furnishing of a receipt or distilling apparatus. Kentucky (14) makes the principal punishable for the agent's violation as if committed in person, and Mississippi (103) prohibits banks from collecting drafts for liquor shipments. Kentucky (16) and Mississippi (105) legislate against corrupt lobbying.

Public Health.—In Kentucky (25) "buying or selling patients," that is, the giving or receiving without the knowledge of the patient of pay for causing the patient to go to another physician or surgeon, and in Virginia (498) any sharing of fees between the physician and surgeon is a misdemeanor. Mississippi (115) requires the use of prophylactic eye treatment on the eyes of the new-born. Virginia (220) permits the restraint of tubercular sufferers who so conduct themselves as to menace public health. Maryland (242, 243) and Massachusetts (55) require notice to health officers of contagious diseases. Cremation or burial of all animals dying from contagious or infectious diseases is required by Virginia (427). A license is required for the practice of chiropody in Maryland (173) and of optometry in Virginia (148). Roller towels in public places are forbidden in Virginia (160).

Pure-food and -drug laws were passed in Rhode Island (1341) and Kentucky (37). Virginia forbids falsely misbranding (422), (9) the sale of deleterious foods including (69) food for animals, and (12) the storage or transportation of foods under unsanitary conditions. Virginia also prohibits the sale of oleomargarine (18) or chicory (208) without public notice, and both these statutes apply to public eating places. Maryland (163) enacts a "Uniform Cold Storage Act," limiting the period during which goods may be so kept, and requiring them to be marked with the date of receipt and withdrawal. New Jersey requires all cold-storage goods to be so labelled.

Public Safety.—The selling, having or carrying concealed on the person a gun silencer is made a felony in New York (137). The sale of poisons is regulated in Massachusetts (78). The employment by a carrier in its operating department of any one unable to understand English or see and understand signals required by the rule book is forbidden in New York (424). Maryland (152) requires the arrest without a warrant of common thieves and pickpockets by any officer having reasonable belief that they are such, and vagrants and tramps (defined, Maryland, 291, 653) receive similar treatment (201), South Carolina and Kentucky (101) require gypsies to buy a license in every county.

Children. — Child-labor laws are amended in Kentucky (23), Maryland (14), Massachusetts (222), Rhode Island (14) and South Carolina (361) (see also XV, *Child Welfare;* and XVI, *Labor Legislation*). New Jersey (45) and Kentucky (6) punish the abandonment of children, and Maryland (210) regulates the placing of children in foster homes and institutions (see also XV, *Child Welfare*). Maryland (637) requires children of sufficient financial means to support their parents. The sale of tobacco, cigars and cigarettes to minors under 18 is made an offense in Porto Rico (21). A curfew law was enacted in Maryland (2). New York (394) requires minors in penitentiaries to be kept so separated from adults that intercommunication is impossible; and Kentucky (85) establishes a separate reform school for girls. Maryland (326) abolishes all technicalities of procedure and evidence in its juvenile courts, and New Jersey (212) limits the use of records of convictions obtained in such courts in other proceed-

ings, and provides for the destruction of these records after two years. Massachusetts (243) separates Juvenile Court Appeal Cases from other appeals. (See also XV, *Child Welfare.*)

Property and Business.—In Virginia fraudulently obtaining property under a contract for personal services and failing to perform or refund (13), failure to return goods delivered for selection or approval (280), and pawning or selling goods held on conditional sale (299), are criminal. New York (366) separates the crime of receiving stolen property into first and second degrees, $50 being the dividing line. Mississippi (120) and Rhode Island (1389) enact statutes against drawing checks without funds, making the failure to cover after notice of dishonor *prima facie* evidence of intent to defraud. Kentucky (97), Maryland (254), Massachusetts (149), and Virginia (42) make punishable untrue, deceptive and misleading advertising, as do Maryland (370, 655) and Porto Rico the fraudulent obtaining of a false commercial rating. Combinations in restraint of trade and unfair local discrimination for destroying competition are forbidden by Kentucky (17). Statutes in Kentucky (18) and Mississippi (132) prevent discrimination in transportation rates, and in Kentucky (19) and South Carolina (371) discrimination in insurance rates. Massachusetts (292) prohibits the practice of law by corporations and (75) makes criminal the assignment of public pensions. The automobile owner is protected against theft in Georgia (458), unauthorized use of his car in Virginia (776), the chauffeur's receiving a bonus or discount for storage or supplies in Maryland (687) and New Jersey (148), and the placing on roads of substances likely to cause punctures in New York (321) and Virginia (364).

Miscellaneous Statutes.—Virginia (356), Mississippi (118) and South Carolina (537) punish the desecration, mutilation, or improper use (advertising purposes) of the United States flag. Massachusetts permits its use in publications to promote patriotism. Virginia (433) prevents discrimination against persons wearing the uniform of military service of the state or United States. The use of the dictograph as an aid in criminal prosecutions for discovering evidence, as well as the intercepting of telephone messages for the same purpose, received some attention in New York during the year, but just how far the right of privacy should be sacrificed to the effort to apprehend those suspected of being engaged in criminal acts remains a question still to be adjusted, as does the punishing as criminal the misuse of the dictograph by private persons.

Procedure.—Virginia (204) authorizes the appointment of a "public defender" for a term of two years, his duties being to defend all accused who are unable to employ counsel. Mental defectives accused of crimes were the subject of consideration in Maryland (699) and Virginia (312). In Maryland the Court may before trial order an examination of the sanity of an accused who pleads insanity as a defense, or whom the court has reason to suspect to be insane, by the lunacy commission, a permanent state board of four members, of whom at least two are physicians, one of the latter having had at least two years' experience in the treatment of the insane. On the report of this commission that the accused is of such mental incapacity as to be unable properly to conduct his defense, the Court orders proceedings stayed and confinement until recovery. A more important change is made in Virginia by "An Act authorizing commitment of persons charged with crime who are suspected of being feeble-minded to city or county farms and providing for length of sentence and examination," which is here given in substance:

(1) . . . The words "feeble-minded person" in this act shall be construed to mean any person with mental defectiveness from birth or from early age, but not a congenital idiot, so pronounced that he is incapable of caring for himself or managing his affairs, or of being taught to do so, and who, consequently, requires care, supervision and control for the protection and welfare of himself, of others and of the community, but who is not classible as an "insane person," as usually interpreted.

(2) When a person is brought before any . . . court of justice for any purpose other than an inquiry into his mental condition, if it appears to the court upon the testimony of the one or more qualified physicians that such a person

is feeble-minded within the meaning of this act, the judge or the justice shall direct some officer of the court, or other suitable person, to file a petition for a commission to conduct an inquiry into the mental condition of such person, and the court, pending the preparation, filing and hearing of such petition, may order the said person to be detained in a proper place of safety; or be placed under the guardianship of some suitable person; or committed to the department of the criminal insane at the appropriate institution, or to a county or city farm, . . . for observation, for a period not less than sixty (60) days, or more than six (6) months.

(3) Upon admission of such person into a city or county farm, the superintendent of such institution shall cause the mental condition of such person to be examined and shall cause such person to be placed under special observation during his stay at the institution, during which time such person shall be subjected to the Binet Simon measuring scale for intelligence, or some other approved test of mentality to be applied by the superintendent of said farm and by an expert designated by the State Board of Charities and Corrections, and at the expiration of the term of such alleged feeble-minded person, the said superintendent shall report the results of his investigation to the court for such action as the said court, or judge, may deem necessary.

(4) The superintendent . . . shall provide for such person suitable employment and shall carefully observe and record the social and industrial reactions of such person and report the same to the court or judge committing said person to said institution.

The language of the statute seems broad enough to effect the reform sought by some writers on the criminal feeble-minded, who maintain that no discrimination should be made in punishability between mental incompetents of this class and those who escape because they are adjudged "legally" insane.

In New York a constitutional amendment is proposed permitting the waiving of indictment and trial by jury in cases of felonies where the punishment does not exceed five years. Maryland (214) and New Jersey (270) give the jury power to fix the punishment for first-degree murder at either death or life imprisonment. Life imprisonment on a third conviction is abolished in Virginia (29) and the length of the additional sentence is left to the discretion of the court. Georgia (157) provides for a supersedeas bond in bailable cases, and Virginia (198) for bail on writ of error. Massachusetts (117) permits the issue of a search warrant on a complaint under oath that narcotics are being illegally kept.

Prisoners.—Kentucky (45) requires jailers to keep records of inmates and to report whether they are confirmed drunkards or drug habitues, and (70) makes it a felony to furnish any convict outside the penitentiary any intoxicant, narcotic or weapon. Maryland (555) abolishes contract labor for convicts. The appointment of policewomen is authorized in Virginia (281), and Kentucky (3) provides for a police-court matron to investigate the histories of women and girls while under suspended sentence pending the final disposition of their cases. New Jersey (138) gives persons detained in jail as witnesses one dollar a day. Virginia (281) credits on the sentence time spent in jail awaiting trial or removal to the penitentiary after sentence or pending appeal. Mississippi (106) creates a pardoning board to make recommendations to the governor. Public hangings are abolished in Mississippi (218). Kentucky (39) and New York (358) amend their laws as to the paroling of convicts. Owing to events in New York's prison management questions of prison reform have received much popular attention and have been widely discussed. (See also XV, *Criminology and Penology.*)

X. PUBLIC RESOURCES AND PUBLIC WORKS

PUBLIC LANDS

MORRIS BIEN

Oregon & California Railroad Grant.—The first session of the Sixty-fourth Congress, which terminated on September 8, did not pass much legislation affecting the public lands, although the roll of legislation was much larger than usual. One of the important acts, approved June 9, 1916, provides for an adjustment regarding the Oregon & California Railroad Land Grant which has been a subject of contention for a great many years. In 1866 Congress granted to the Oregon & California Railroad Co. certain lands, mostly in the state of Oregon (a very small amount being in the state of Washington), on condition that the Company would build a certain railroad. This Act was modified by subsequent acts in 1869 and 1870. The railroad construction was begun in 1873, partially finished within two or three years, and finally completed in 1887.

One condition of the grant was that the lands should be sold to actual settlers only, in quantities not exceeding 160 acres to each person, and at prices not greater than $2.50 per acre. During the first few years these conditions were complied with but later, the demand for the land having increased, the Company sold a great deal of land in large tracts to persons who were not actual settlers and at prices exceeding $2.50 per acre. After Jan. 1, 1903, the Company refused to make any more sales, holding at that time over 2,300,000 acres unsold, and more than 4,000 persons tried unsuccessfully to purchase the land after that date. In 1908 Congress authorized the bringing of suit in order to determine the action to be taken in the case. The matter was pending in the courts until June, 1915, when the U. S. Supreme Court decided that the United States had a right to enforce its claim of forfeiture against the Company. This placed in the hands of Congress for disposition the said area of 2,300,000 acres.

The Act provides that these lands shall be classified and appraised. Certain lands which are valuable for water-power sites are to be set aside for such action as may be later determined upon by Congress. Another class of lands is valuable timber land, which is to be appraised and sold, and a third class is agricultural land, which will include timber lands after the timber has been taken off. The proceeds of the sales of these lands are to be distributed so that the Railroad Company shall receive $2.50 per acre for the lands in its grant; the states shall receive the taxes which were due and unpaid; and the remainder will be divided as follows: one-fourth to be paid to the states for the benefit of the school funds; one-fourth to the counties in which the lands lie, for the benefit of schools, roads, bridges, etc.; 40 per cent. to be paid into the Reclamation Fund, established for the construction of irrigation works by the United States, and 10 per cent. into the general funds of the Treasury. The purpose of Congress in this law was to devote the land to the purpose originally intended, namely, the encouragement of settlers upon small farms sufficient for the support of a family.

Lassen Volcanic National Park.—An Act of Aug. 9, 1916, set apart an area of nearly 80,000 acres to preserve for the benefit of the public in

general the area occupied by Lassen Peak, which has in recent years shown much active volcanic energy and has been studied by many scientists of this country (*A. Y. B.*, 1914, p. 597; 1915, p. 599). Besides the Peak itself, the park contains much of interest, there being hot springs, mud geysers, ice caves, and a number of beautiful lakes.

Irrigation Districts.—An Act of Aug. 11, 1916, provides that the public lands within irrigation districts shall under certain conditions be subject to taxation for the expenses of the irrigation district. Irrigation districts are public corporations which by state law have the power of taxation for the purpose of constructing, operating, and maintaining irrigation systems, and they are authorized to lay a tax upon all land within the limits of the irrigable area of the system. One difficulty encountered in many cases is the fact that among the lands to be benefited by the irrigation enterprises are public lands of the United States, which could not be taxed to assist in the construction and care of the irrigation works. The Act provides that when the Secretary of the Interior is satisfied that the plan of the irrigation district is feasible and approves the same, the public lands of the United States therein shall be subject to the taxes of the district, and any person taking them under the public-land laws shall be required to pay such taxes. (See also *Reclamation, infra.*)

National Parks and Monuments.—During the year 1915 the national parks in the West were opened more generally to motor travel, with the result that the number of automobile licenses issued increased from 4,500 in 1914 to nearly 13,000 in 1915. Two new national monuments were established during 1916: one in New Mexico known as Capulin Mountain, an interesting mountain formation; and the other in Maine known as the Sieur de Monts National Monument, named after the chief of the expedition under whose orders Champlain explored the region which was afterwards known as Mount Desert Island, on which is now located the resort of Bar Harbor. The park itself contains an area of about 5,000 acres, in which are impressive mountains, beautiful lakes and woodlands.

Disposition of Public Lands.—The total area of public lands entered during the year ending June 30, 1916, was 19,043,152.92 acres, an increase of 2,181,938.23 acres as compared with the area entered during the preceding year. The total cash receipts from the sale of public lands during the fiscal year 1916 were $3,428,588.20; from the sale of Indian lands there were received in addition $2,000,-516.17. These figures represent an increase of $86,153.86 as compared with the receipts for the preceding year. The area of lands patented during the year was 12,161,807.998 acres, a decrease from the preceding year of 863,619.978 acres. Of the area patented 7,723,738.23 acres were taken under the homestead law, a decrease from the preceding year of 1,871,-234.79 acres.

MINERAL RESOURCES

U. S. GEOLOGICAL SURVEY

GEORGE OTIS SMITH

Functions.—The widely extended investigations of the U. S. Geological Survey have been pushed forward vigorously during the year. The work of this Federal organization embraces a considerable range but is carefully systematized. The annual appropriations are now over $1,500,-000, and immediately after Congress passes the appropriation bill, comprehensive plans are made for the field work for the ensuing year in geologic investigations, both scientific and economic, topographic mapping, investigations of water resources, investigations of Alaskan mineral resources, and classification of the public lands. These plans may vary considerably from year to year, but each year's plans are adhered to closely. Small contingent allotments are provided for the treatment of special problems that may arise from time to time. Chemical and physical researches and the preparation of the report on the mineral resources of the United States follow much the

same general course from year to year, although even in these branches of the work important changes are often made. The classification of the public lands presents ever changing and broadening problems as the Government comes to be more and more recognized as a conservative landlord who must handle his large holdings as a trustee for the benefit of the citizens of the present day, as well as with an eye for the needs of the future.

Topographic Surveys.—In laying out the field work for the year, in topographic surveys, for which an appropriation of $350,000 is made, consideration is given in the first instance to the demands of the geologic field work of the Survey, for which topographic base maps are needed. Next are considered the formal requests for topographic mapping which have been made by state geologists or state engineers, many of the state officials offering coöperation to the extent of defraying one-half the cost of the work or even more. Special consideration must also be given by the Director in his allotment of topographic funds to the needs of the Federal Government, which still owns many million acres of unsurveyed public land in the West, much of it rich in mineral resources. The topographic surveys are very popular because of the many uses to which the resulting maps are put: they are in demand by people of almost all classes, from hikers and autoists to railroad and mining engineers. Besides the principal topographic appropriation, there is $75,000 for topographic surveys in national forests and $35,000 for topographic surveys of areas selected by the War Department.

Geological Investigations.—In deciding upon the distribution of the geologic appropriation, which in the fiscal year 1916 was $350,000, consideration is given first to the pending geologic investigations and problems that are being carried on year after year by the Federal Survey, and next to the demands of the state geological surveys for work within their respective states, some of them, as in the case of the topographic surveys, also offering coöperation. This geologic work has many divisions and subdivisions. It includes, for instance, studies of the Coastal Plain, of the coal, phosphate, and oil and gas fields of the United States, and of the mining districts of the West, besides the detailed study of particular areas preparatory to the publication of the folios of the great *Geologic Atlas of the United States.*

Water-Resources Investigations.—The next field branch is the water resources branch, with an appropriation of $150,000. It is a difficult problem to make this small appropriation cover the investigation, for the whole United States, of our greatest mineral resource. In this work also special consideration is given to the requests of state officials for work in their respective states, and coöperative assistance is offered by many of the states, and other outside organizations. Plans for the expenditure of the other appropriations are made in a similar manner, and in all of them the Director must give special consideration to the requests of other Government departments or bureaus that depend upon the basic work of the Geological Survey.

Activities of the Year.—Investigations in geology were conducted during the year in 47 states, aggregating 43,000 sq. miles of detailed and reconnaissance surveys. The work included studies of the metals, coal, oil and gas, and a continuation of the search for potash and nitrates. New areas amounting to nearly 20,000 sq. miles were mapped topographically in 29 states, and over 3,000 sq. miles were resurveyed. Seventeen of these states coöperated in the work. In the investigation of water resources, stream gauging was carried on at 1,300 gauging stations in 39 states, and underground-water problems were studied in 16 states. Much of this work was done in coöperation with the states and other Government bureaus. In Alaska geologic investigations covered nearly 11,000 sq. miles, and topographic surveys, 10,500 sq. miles. Investigation of various kinds were carried on in Hawaii, the Canal Zone, and the West Indies.

Land classification work included the classification of 4,300,000 acres of

public lands as to their mineral character, of about 190,000 acres as to their value for power or as public water reserves, and of over 27,000,000 acres as non-irrigable land subject for designation under the Enlarged Homestead Act.

A million and a quarter reports and maps were distributed to the public, most of them free, but more than 400,000 topographic maps and geologic folios were sold, an increase of 17 per cent. over the preceding year. New publications of the year comprised 210 reports, 33 reprints, 6 geologic folios, 126 new topographic maps, 11 revised maps, and 16 state maps; in addition, 109 maps and many reports were reprinted. The total editions of the folios and maps of the survey aggregated 950,000 copies.

A notable publication recently begun by the U. S. Geological Survey is a complete report on the coal fields of the United States. The general summary, which includes estimates of reserve tonnage and a large wall map showing coal deposits of various classes, is now in press and is to be followed by detailed reports for each state.

STATE GEOLOGICAL SURVEYS

William O. Hotchkiss

Activities and Resources.—Thirty-seven states maintained geological surveys during 1916. There was, however, considerable decrease in activities, due to inadequate appropriations. Curtailment of funds caused embarrassment in Arkansas, New Mexico and Pennsylvania. W. H. Twenhofel resigned as state geologist in Kansas to accept a professorship in the University of Wisconsin, and was temporarily succeeded by Erasmus Haworth until a permanent successor is selected. Prof. Herbert E. Gregory succeeded William North Rice as state geologist of Connecticut. The Association of American State Geologists held their annual meeting in Albany, N. Y., on Sept. 4-9, and again met on Dec. 27-29 for exchange of plans and conference with coöperating Federal officials. The chief function of state surveys continues to be the collection and dissemination of information relative to mineral resources and geological structure. Many, however, have charge of road building forestation, water-power development, soil improvement, and natural-history study. In the year 1916 the state surveys expended approximately $600,000, and received the benefits of about $125,000 additional funds from coöperating Federal and state departments. About 115 scientists were employed during the year by the various states, with approximately 30 others furnished by outside bureaus. In addition a large force of topographers and soil experts were engaged in making coöperative maps.

Topographic Maps. — Topographic maps were prepared in 15 or more states, under coöperation between the states and the U. S. Geological survey (see also *U. S. Geological Survey, supra*). Owing to the growing importance of military necessities, the value of topographic maps has recently been appreciated far more than in the past. It is probable, therefore, that a greater activity in the making of these maps will result, on the part of both the state surveys and the U. S. Geological Survey. Of especial interest is the fact that in 1916 the topographic mapping of the state of Ohio has been completed. Ohio is the first state west of the Appalachian Mountains to have finished the topographic mapping of its area.

Economic Geology.—The expenditure of state funds for geological surveys continued to be directed chiefly to the discovery and development of materials of commercial value. In connection with this many theoretical and educational studies were made. Practically all state surveys published mineral statistics for the year. This work is under the direction of the U. S. Geological Survey, and constitutes the most reliable index to activities in mining and metallurgy. In the following paragraphs are summarized other economic investigations of the year.

Stones and Minerals for Building Purposes and the Arts.—The examination and investigation of clay resources was actively carried on in most of the states. New Jersey made

broad, technical studies. Maryland has in process of preparation a bulletin on fire clays. Illinois published a bulletin on clay and shale materials available at coal mines, as a basis for supplemental industry, and completed a survey of the Ottawa quadrangle in a region producing coal, clay, glass sand, and Portland cement. Reports on the building stones and clays of Minnesota have been completed. Studies on the gumbo and light-burning clays of Iowa have been carried on. In Virginia there has been a continuation of the investigation of the clay resources of the Appalachian Mountains province. The field work was completed, and the laboratory investigations of the material collected are in progress. The completed report will be ready some time in 1917. A report on the clay resources of the Piedmont Plateau province in Virginia is in press, and a report on the slate deposits and slate industry is ready for the printer. Work on the pegmatite bodies (feldspar, mica, and quartz), and on the manganese and barite deposits was continued, but not completed. The geology of the salt and gypsum deposits of the state has been incorporated in a bulletin. A study of the limestone resources of Michigan has been made, and work on mineral resources in general has been conducted. The war in Europe has been the cause of some of the western states devoting time to the investigation of potash and salines. Colorado has published a report on the Gold Brick district, Gunnison County, and Texas has in preparation one on the lime and cement industries. The work in Georgia has been largely economic, giving the occurrence of bauxite, fuller's earth, slate and pyrites.

Coal and Peat.—Because of Illinois' vast fields of undeveloped coal, the state survey devoted much of its time to work in this direction. Four reports have been published, covering the coal resources of Franklin, Williamson, and Jefferson counties, the Springfield quadrangle coal resources, valuation of coal for gas manufacture, and surface subsidence due to coal mining in Illinois, together with a map of the state, showing coal fields and each shipping mine, and a directory of operating companies. Reports are ready for printing on the Saline-Gallatin Counties coal resources, including 576 sq. miles just west of the Ohio River, and coal resources of a portion of Jackson County in southwestern Illinois, which includes the state's highest-grade coal. Several of these publications have been prepared in cooperation with the U. S. Geological Survey and the U. S. Bureau of Mines. Virginia has continued its topographic and geological surveys of the coals of the southwest part of the state, in coöperation with the U. S. Geological Survey, and has published a report on the coal resources of the Clintwood and Bucu quadrangles. Minnesota has made a study of the peat resources of the state. North Dakota is conducting an investigation of the coal deposits of Dunn County. West Virginia has ready for publication a report on the coal area of Mercer County. The coal deposits of western Maryland are described in a report of the state survey. New Mexico plans to conduct an investigation of its coal resources as soon as funds are available. Work has been prosecuted in Iowa in the chemical study of coals.

Oil and Gas.—The scattered oil and gas fields of Illinois were covered in a reconnaissance survey as follows: a structural map and report of Saline, Gallatin, Williamson, and Johnson counties; a report on the Hardinville, Birds, Sumner, and part of the Vincennes quadrangles, and on the structure of the Avon-Canton quadrangles; and second supplementary report on Bremen anticline. A survey was made of the oil resources in the vicinity of the Sandoval field. Tennessee conducted an investigation of its oil shales. North Dakota made a study of the gas in the artesian waters of the southeastern part of the state. South Dakota made a short investigation of oil conditions in the vicinity of Pierre. A reconnaissance survey of the eastern part of Colorado was made, for the purpose of discovering areas and structures favorable for the occurrence of oil and gas. Detailed petroleum work on Byron, Garland, Oregon, Basin, and Cody anticlines was car-

ried on in Wyoming. Many of the West Virginia reports include material on the oil and gas fields and prospective areas. Under the jurisdiction of the state Mining Bureau, California has carried on extensive investigation of the petroleum industry of the state. Many of the data secured have been incorporated in publications.

Iron, Lead, and Zinc.—A report on the gray (magnetic) iron ore of Alabama has been published. Michigan has continued the survey of magnetic ores in Marquette and Baraga counties, and on the east end of the Menominee iron range in Dickinson County. In Wisconsin magnetic surveys have been made of large areas in the Black River Falls area. In Minnesota a detailed study is being made of the iron ores of the Cuyuna Range, and of the titaniferous magnetites and titaniferous iron ores of the northeastern part of the state. Iowa has issued a bulletin on the iron-ore deposits near Waukon. The pyrite of Georgia has been examined. The geology of the iron ores of the Blue Ridge Mountains and of the western part of the state has been covered in a report by Virginia. Missouri investigated the economic geology of the southwestern lead and zinc fields. Tennessee devoted some attention to its zinc deposits.

Detailed Areal Surveys.—Surveys of geological formations underlying large areas were made in the various states. Most of these included determinations of structure, and the vertical sequence of formations. Such work is usually based on quadrangle maps or county maps, with or without topographic expression. During 1916 surveys were made of several counties in Iowa, and this phase of their work is nearly completed. In Ohio five counties are treated in a bulletin of 700 pages. Maryland has published three county maps. Detailed areal surveys have been published in Illinois for two quadrangles, with the survey of two others completed and a new one begun. In New York work has been carried on in undefined areas in the Mohawk valley and Catskill Mountains. County reports of five counties have been issued in Missouri. An areal survey of Minnehaha County was conducted in South Dakota. In Colorado a reconnaissance survey was made of the eastern part of the state. Wyoming made surveys of part of its area. In coöperation with the U. S. Geological Survey, the state of Washington has completed the survey of two quadrangles. The areal geology of the southern part of the northwest area and of two quadrangles in the western part of the state (Tomah and Sparta) is being studied in Wisconsin. West Virginia has completed field studies on detailed geological county reports, which will be published in the near future. Three counties have been surveyed in Tennessee. Texas mapped four counties.

Stratigraphic and Paleontologic Geology.—Investigations closely allied to those just mentioned, but with special emphasis on correlation and vertical sequence of stratigraphic units as determined or supported by study of fossils, may be described as follows. Field work is being continued on the Pre-Cambrian area in Michigan, including west end of Marquette range and north and west sides of the Huron Mountains. Detailed studies of the Comanchean and Cretaceous of Kansas were made. The Dunkard and Silurian formations of Ohio are continuing to receive attention, but it will be several years before this investigation is completed. The mapping of the junction of the Mississippian and Pennsylvanian in the northeastern quarter of Ohio has been completed. Illinois has continued its study of the Mississippian section in the southern part of the state, between the Ohio River section and Mississippi River section below East St. Louis. Stratigraphic and paleontologic studies have been carried on in Iowa covering the Devonian and Mississippian systems of the state. An important conference on Mississippian stratigraphy was held by representatives of Illinois, Missouri, and Kentucky surveys and of the U. S. Geological Survey. A trip was made extending from the vicinity of St. Louis into western Kentucky. A general agreement was arrived at as to sequence and relation of principal stratigraphic units, and a satisfactory basis established for detailed mapping in the various areas concerned. In

Illinois there has been detailed mapping of Mississippian formations in the Brownfield quadrangle. General stratigraphic studies have been continued by the collection of drill records and study of cuttings from deep wells and core drillings. New York has issued miscellaneous paleontological reports. Work has been done in North Dakota in the mapping of the distribution of the pre-Wisconsin drift and old Pleistocene valleys in Dunn County. Mississippi has completed the field work necessary for the completion of a report on coastal plain stratigraphy. Stratigraphic and paleontologic studies of the Mississippian in Missouri have been prosecuted. In Wisconsin stratigraphic work has been done in the Sparta and Tomah quadrangles, and Dr. E. O. Ulrich spent several weeks in completing field work for a general stratigraphic report on the state.

Miscellaneous Maps and Investigations.—California has in press reports on the mineral resources of 19 counties; the field work has been completed and manuscripts are being prepared on nine counties; and a bulletin on the mineral production for the year 1915 is in press. Tennessee has issued new maps of Decatur, Chester, and Henderson counties. Colorado has mapped about 450 sq. miles in the southwestern part of the state to show drainage, roads, trails, houses, and mines. This is a continuation of the reconnaissance survey of the carnotite area of western Colorado, begun in 1914. A report has also been issued on the Bonanza district, Saguache County. Texas has mapped four counties. A geological map of Virginia has been prepared, revising the one of 1911, and a report completed on the geology of the salt and gypsum deposits. Ohio has published two bulletins, treating the geology of Cincinnati and vicinity, and another laying stress on the economic studies of five southern counties. Many reports have been completed in Illinois, covering practically every phase of its natural resources. A manuscript on the geography of South Dakota, and a geological map of the state are in process of construction. The state survey is also studying and mapping the lignite beds, and attention is being given to the Pleistocene deposits. A beginning study of the archaeology and distribution of native flora of Mississippi has been undertaken. Reconnaissance surveys have been carried on in most of the states. A volume on the physical geography of Wisconsin was published, and other studies are under way. A geological survey of the superficial formations of Minnesota is in press.

Surface and Underground Waters.—Most states have come to realize the importance of the study of water supplies for domestic and industrial purposes. In Washington steady progress has been made in hydrographic work; about 130 gauging stations have been maintained on the principal streams of the state, and profiles have been run on several of the mountain streams. It is planned to describe the water power of these mountains in several bulletins, three of which have been printed, the field work being completed for the remaining four. Ohio has completed an investigation of the water of the state for manufacturing purposes, but the manuscript is not completed. Wisconsin, Maryland, Illinois, Mississippi, Missouri, and Virginia have published or have in process of printing reports on the underground and surface water supplies of their states. New Jersey has established an administrative control over, and supervision of, water supplies and dams of the state. Waters of central Oklahoma were studied in detail.

Soil, Forest, and Highway Investigations.—Many states, alone or in coöperation with other bureaus, investigated soils, forests, and highways. Tennessee has issued soil maps of two counties, and has continued the study of land reclamation by forestation. New Jersey has completed soil surveys of about 700 sq. miles, and has made physical and chemical tests of road materials for the Department of Public Roads. In Maryland maps of three counties were issued. In Wisconsin soil surveys of several counties were published, and much work done in connection with the state Highway Commission, of which the state geologist is a member. North Carolina continues to devote attention to the construction of state highways.

RECLAMATION

FRED G. HARDEN

The Reclamation Service.—The Sundry Civil Appropriation Act approved July 1, 1916, authorized the expenditure of $8,884,000 and the unexpended balances of the sums appropriated in 1915 upon Reclamation-Service projects during the fiscal year ending June 30, 1917. By an act of July 26, 1916, Congress extended the time within which advantage may be taken of the Reclamation Extension Act of Aug. 13, 1914 (*A. Y. B.*, 1914, p. 274).

During the year a number of the project revaluation boards appointed in 1915 (*A. Y. B.*, 1915, p. 286) have reported and the reports have been reviewed by the central board. Only three reports of the central board have been made public, those for the Carlsbad, the Belle Fourche and the Shoshone projects. That for the Carlsbad project recommended that certain small items be adjusted and that the cost price be fixed at $47 per acre; that for the Belle Fourche project that the price remain as fixed at $43 per acre and the Government stand any additional cost; and that for the Shoshone project the cost price per acre be left as fixed, but that some facilities should be provided for extending credit to worthy settlers in order that they might get their holdings under cultivation more cheaply and more rapidly.

The Reclamation Service during the year has been encouraging the water users on the several projects to form irrigation districts to take over the management of the projects and drainage districts to drain lands needing drainage. The formation of irrigation districts, it is believed by some, will remove the question of whether the water users on the Government projects can take advantage of the Farm Loan Act (see XVII, *Agriculture*).

The Elephant Butte Dam was dedicated on Oct. 14. During the fiscal year ending June 30, 1916, the capacity of the reservoirs of the Service was increased by 2,500,000 acre-ft.; nearly 1,000 miles of canals, ditches and drains were constructed; 8,000 canal structures were built; about 300,000 ft. of pipe laid; and 100 miles of canal lined. About 10,000,000 cub. yds. of excavation were made during the year on the various projects, bringing the total to over 140,000,000 cub. yds.

The net amount expended upon primary projects during the fiscal year was $6,386,416.16, bringing the total net investment in primary projects up to $100,999,960.58. The total allotment for the fiscal year 1917 is approximately $8,271,000, and the total estimated cost of the projects when completed approximately $175,000,000. The total collections during the fiscal year 1916 are given in the accompanying table and bring the totals up to $4,146,630.35 for construction; $2,448,095.09 for operation and maintenance; $4,428,000.80 for miscellaneous services; $3,330,319.89 for temporary water rentals; and $1,040,524.57 for power.

The Service was prepared to furnish water during the crop season of 1915 to 1,330,222 acres in its own projects. Of this area 814,906 acres were irrigated and 757,613 acres cropped. The total value of crops raised was $18,164,452. There were 18,624 farms irrigated. The following table shows the acreages of different crops and the average value of the crops per acre:

Crop	Acreage	Average Value Per Acre
Cereals	211,605	$16.85
Other grains and seeds	27,844	30.17
Alfalfa	335,161	19.27
Other forage	152,664	12.16
Vegetables and truck	31,963	68.31
Fruits and nuts	25,927	63.54
Sugar beets	20,848	59.29
Cotton	3,325	61.55
Other crops	3,291	49.84
Total cropped	757,613	$24.00

Carey Act Lands.—There was a marked increase during the fiscal year in the acreages finally disposed of under both the Carey Act (Aug. 14, 1894) and the act for temporary withdrawals (March 15, 1910), and a large falling-off in the application for segregations and withdrawals under both acts. The acreages under the Carey

State	Project	Appropriated for year ending June 30, 1917	Net Investment During Year Ending June 30, 1916	Charges Collected During Year Ending June 30, 1916			Acreage for Which Water Could Be Supplied, 1915	Acreage Irrigated, 1915 [1]	Acreage Cropped, 1915	Crop Value Per Acre, 1915
				Construction	Operation and Maintenance	Miscellaneous				
Arizona	Salt River	$480,000	$18,834.14			$488,188.41	219,691	179,350	171,832	$21.31
Arizona—California	Yuma	759,000	460,396.00	$54,883.57	$16,744.78	50,503.00	72,440	27,857	25,101	34.81
California	Orland	33,000	81,515.52			1,565.05	20,320	8,928	6,930	31.81
Colorado	Grand Valley	309,000	433,646.60			6,959.99				
	Uncompahgre	288,000	352,055.90			82,743.07	65,000	41,463	40,553	25.76
Idaho	Boise	540,000	611,084.00			169,766.04	150,000	76,705	69,818	21.87
	Minidoka	302,000	48,128.98	43,326.17	51,250.02	94,775.19	120,000	83,562	77,008	22.41
Kansas	Garden City	2,000	55.52							
Montana	Huntley	160,000	109,711.09	14,491.20	19,757.48	4,313.12	30,813	18,203	18,185	29.41
	Milk River	696,000	289,447.11			4,967.58	22,200	4,192	3,887	13.18
	St. Mary Storage		594,712.58			2,710.96				
	Sun River	205,000	723,074.13	[5] 7,481.59	5,556.28	17,987.69	16,326	4,261	4,243	19.00
Montana—North Dakota	Lower Yellowstone	30,000	12,670.81	924.13	649.48	13,094.61	42,329	12,656	11,980	16.18
Nebraska—Wyoming	North Platte	1,100,000	271,054.90	115,478.26	56,833.54	12,073.79	129,714	70,007	68,130	18.55
Nevada	Truckee-Carson	220,000	[2] 1,303.15	32,432.09	34,291.79	30,575.97	65,000	40,295	38,495	15 39
New Mexico	Carlsbad	323,000	72,527.77	21,038.78	15,482.02	3,439.60	24,796	13,470	11,322	21.70
	Hondo	4,000	2,633.15			1,038.57	3,330	1,294	1,287	13.81
New Mexico—Texas	Rio Grande	595,000	[3] 825,426.97			[3] 66,862.30	45,000	33,876	32,246	34.22
North Dakota	North Dakota Pumping	50,000	[2] 7,320.51	210.53		27,298.77				
Oklahoma	Lawton	51,000	902.21			.20				
Oregon	Umatilla	235,000	266,133.11	10,225.97	10,105.44	10,495.88	17,000	5,305	3,603	29.04
Oregon—California	Klamath	180,000	92,072.40	13,376.98	26,503.71	9,007.69	38,000	27,254	27,254	13.85
South Dakota	Belle Fourche	98,000	54,696.88	34,456.18	24,611.89	5,224.18	78,591	44,067	43,063	10.72
Utah	Strawberry Valley	315,000	453,100.34	19,827.87	5,129.23	41,493.74				
Washington	Okanogan	58,000	42,247.15	73.22	802.27	11,035.07	10,099	7,800	4,814	52.60
	Yakima—Storage		214,206.18	100,000.00		14,169.89				
	Yakima—Sunnyside	798,000	176,476.63	45,891.88	65,377.53	8,862.48	82,757	66,607	54,919	50.08
	Yakima—Tieton		[2] 24,260.38	43,903.80	24,940.76	2,348.06	34,000	22,000	18,100	37.00
Wyoming	Shoshone	762,000	212,490.13	28,104.41	22,803.80	22,351.54	42,816	25,753	24,833	16.51
Coöperative and secondary projects		50,000	[4] 51,011.58							
General expenses			[4] 22,933.30							
Jackson Lake Enlargement		241,000								
Total		$8,884,000	$6,386,416.16	$571,161.45	[5] $380,840.02	$1,204,066.61	1,330,222	814,906	757,613	24.00

[1] Water furnished to 41,872 acres not in the U. S. Reclamation Service projects.
[2] Receipts exceed expenditures.
[3] Includes Elephant Butte.
[4] Not included in total.
[5] Adjustments.

Act were: segregations applied for, 98,664.85; segregated, 13,215.12; rejected or relinquished, 239,957.54; patented, 141,519.15; bringing the totals since the passage of the Act up to 7,781,110.18 acres, 3,705,445.16 acres, 3,059,927.24 acres, and 601,573.38 acres, respectively. Under the act of March 15, 1910, the acreages were: withdrawals applied for, 149,578.23; rejected before withdrawal, 855,613.88; withdrawn, 193,040.93; restored, 752,717.72; making the totals since the passage of the law, 4,755,398.62 acres, 2,183,345.27 acres, 2,398,064.59 acres, and 1,990,623.85 acres, respectively.

U. S. Department of Agriculture.—The Agricultural Appropriation Act approved Aug. 11, 1916, carried the following amounts for investigations along the lines of irrigation and drainage to be made during the fiscal year ending June 30, 1917: investigations of western irrigated agriculture and the utilization of reclaimed lands, $75,380; demonstration and advice to settlers on government projects, $40,000; to investigate the utilization of water in farm irrigation and the customs, regulations and laws affecting irrigation, $103,400; to investigate farm drainage, $94,720; and to make investigation and experiments in problems connected with the establishment of dairy and meat production enterprises on semi-arid and irrigated lands in the western United States, $40,000.

Private Irrigation.—The market for irrigation bonds has improved somewhat during the year, especially for those of irrigation districts making the issue for the purpose of taking over works already constructed or to provide for extensions or improvements to existing systems. Settlement of the lands still remains the greatest handicap to irrigation development. The slowness of settlement of projects was brought out in a table and set of curves published during the year in *Engineering News* (lxxvi, No. 5), based upon averages compiled from the data collected by the Bureau of the Census in 1910. They showed that the following percentages of the acreages included in projects were irrigated at 10-years intervals from the date of beginning:

Years After Beginning of Project	Acreage in Project		
	5,000 to 15,000	15,000 to 50,000	Over 50,000
10	46	40	27
20	64	54	39
30	74	63	46
40	78	71	51
50	80	78	..

Irrigation Legislation and Judicial Decisions.—By an Act approved Aug. 11, 1916, Congress provided that, with the approval of the Secretary of the Interior, public lands subject to entry or entered, but for which final certificates have not been issued, may be included in an irrigation district provided the majority of the acreage in the district is not unentered lands. When the lands are so included they may be assessed for district purposes, and the assessments when made become a lien against the lands the same as against the private lands included in the district. The assessment against the entered but unpatented lands can be enforced by sale of the entryman's interest. Those against unentered lands are to become a lien against such lands and must be paid by a future entryman before he will be permitted to make entry. The law provides also that no obligation shall be created against the United States, and also that the Secretary of the Interior may at the expiration of 10 years from the date of his approval release any lands of either class from the liens that may have been created. (See also *Public Lands, supra.*)

The U. S. Supreme Court in Pacific Live Stock Co. *v.* Lewis (241 Pac. 440) has upheld the water code passed by the legislature of Oregon in 1909 and amended in 1913. This code provided for ascertaining and settling the rights to the use of the waters of the state for irrigation and other purposes by a state Water Board, the findings of which are reviewed and passed upon by the circuit courts. The Supreme Court of Idaho has upheld the right of a drainage district to assess an irrigation canal company, a canal of which contributes to the waterlogging of the lands in the drainage district (Canyon County Drainage District No. 1, *v.* Farmers Coöperative Canal Co. It

also, in Nampa and Meridian Irrigation District *v.* Petrie (153 Pac. 425), reaffirmed its position that an irrigation district may provide for, and that it is an implied duty that it do provide for, the drainage of lands within its boundaries.

The interstate water-right case between the water users from the Arkansas River in Kansas and Colorado was settled during the year by agreement, the Kansas users agreeing to claim no rights prior to Aug. 27, 1910, and the Colorado users agreeing to pay the costs of the suit. The suit of Wyoming *v.* Colorado, involving the rights of Colorado and Wyoming water users to water from the Laramie River, has been argued before the Supreme Court of the United States but no decision has been rendered as yet. Evidence is still being gathered in the suit involving the rights of Nebraska and Colorado water users to water from the South Platte River. A committee has been appointed in California to determine and provide for the protection of the rights of users in that state to waters from the Colorado River.

The state water-problems conference provided for by the legislature of California in 1915, for the purpose of recommending "a unified state policy with reference to irrigation, reclamation, water storage, flood control, municipalities, and drainage," filed a voluminous report with the governor in November. Among the more important recommendations were the following: that the duties of the present state Reclamation Board, the state Water Commission, and the state Irrigation Board be consolidated in a state Flood Control Board; that limits be placed upon riparian rights; that irrigation be considered a use of water superior to navigation; that inland waterways be constructed; that there be coöperation in the storing of flood waters; that the state control the construction of dams and reclamation works; that the state aid and loan its credit to irrigation, drainage, flood control, and power enterprises; and that a superior judge be appointed to try all water cases.

Irrigation Conferences.—The Twenty-third International Irrigation Congress met at El Paso, Tex., Oct. 14-18. Resolutions were adopted favoring the sale of timber from Federal forest reserves and the use of the proceeds to build storage reservoirs in the arid section; the reduction of water-right charges on Reclamation-Service projects by charging off the costs of works designed or serving as adjuncts to flood control; the reclamation of arid, swamp, and overflow lands by irrigation districts, the Federal Government aiding by guaranteeing the interest upon the bonds issued; the construction by the United States of works to divert water for irrigation as a part of the flood protection scheme; the endorsement of the Newlands river-regulation bill, and the plan for the Federal Government to build irrigation works and the states to undertake the settlement of the lands and to give financial aid to the settlers upon the lands so irrigated.

The second Pan-American Scientific Congress which met at Washington, Dec. 27, 1915, to Jan. 8, 1916, passed resolutions recommending that a commission be appointed by the American Republics to investigate the laws and regulations affecting the distribution, application, and use of water upon arid and semi-arid lands, the adjudication of rights pertaining to the use of surface and underground waters, the methods of conserving such waters, and the administrative practices of regulating their use. (See also XVII, *Agriculture.*)

Irrigation associations met in nearly all the states of the irrigated section during the year and discussed irrigation practices, construction, needed legislation, plans for financing and the settlement of projects.

Drainage.—Severe floods occurred during the year in southern California, at Yuma, Ariz., and in the southeastern part of the United States. Heavy damages were caused in these localities, and especially so in southern California, where several large rock-fill dams, which impounded water for irrigation and municipal purposes, were swept away. (See also XXI, *Civil Engineering.*)

Some of the noteworthy drainage and flood-protection developments during the year were: approval by the War Department of the plans for the draining of 265,000 acres in the

St. Johns Drainage District in Florida at an estimated cost of $3,000,000; letting of contracts by the Little River Drainage District in Missouri for the reclamation of 500,000 acres at an estimated cost of $4,000,000 and requiring the moving of 43,000,000 cub. yds. of earth; completion of the plans by the engineers and their approval by the Court for the Miami Conservancy District in Ohio; and report of the engineers for the Franklin Conservancy District in the same state. The plan for the Miami District includes retaining basins with a total capacity of 840,000 acre-ft. and channel improvements to care for a flood 40 per cent. greater than that of 1913. The estimated cost is $23,539,872 and the dams will require 9,500,000 cub. yds. of earth and 190,000 cub. yds. of concrete. The plan for the Franklin District provides for reservoirs and levees to care for a flood 45 per cent. greater than that of 1913; the estimated cost is $10,125,000.

The following table shows the acreages patented by the United States to the several states under the acts of March 3, 1849, Sept. 28, 1850, and March 12, 1860, as swamp and overflow lands, and the cash and land indemnities under the acts of March 2, 1855, and March 3, 1857:

State	Swamp Lands Patented (acres)	Indemnities	
		Cash	Lands (acres)
Alabama	418,520.14	$27,691.50	20,920.08
Arkansas	7,685,512.07	374,450.00	.....
California	2,095,105.18	.....	.....
Florida	20,201,045.30	67,221.69	94,702.85
Illinois	1,457,359.20	473,875.99	2,309.07
Indiana	1,254,270.73	39,080.14	4,880.20
Iowa	873,816.42	587,477.59	321,976.98
Louisiana	9,357,928.14	53,118.65	32,265.08
Michigan	5,655,689.56	15,922.06	24,038.69
Minnesota	4,662,727.10	.....	.....
Mississippi	3,284,280.08	46,449.62	56,781.76
Missouri	3,346,024.51	195,874.82	81,016.69
Ohio	26,251.95	29,027.76	.....
Oregon	262,590.34	.....	.....
Wisconsin	3,251,462.34	185,278.97	105,047.99
Totals	63,832,583.06	$2,095,468.79	743,939.39

The Commissioner of the General Land Office in his report for the fiscal year ending June 30, 1915, states that these grants have quite largely failed of the purpose for which they were made and recommends that legislation be passed by Congress limiting the time within which new claims may be received and recognized.

The sixth annual National Drainage Congress was held at Cairo, Ill., Jan. 19-21. The chief topic discussed was river and flood protection and control. Coöperation between the Federal Government, the states, and the minor civil divisions was advocated.

The committee of the American Society of Civil Engineers on flood and flood protection presented a report to that body giving a general survey of the subject, describing various suggested methods of improving rivers and preventing floods, and making definite conclusions as to the value of the various methods.

Drainage Legislation and Judicial Decisions.—The U. S. Supreme Court held in Cubbins *v.* Mississippi River Commission (241 U. S. 351) refused to grant an injunction and held that the states and the River Commission might build levees along the Mississippi River even if incidentally damage was done to adjoining lands. The Supreme Court of Utah upheld the drainage-district law passed in 1913 and amended in 1915, holding that the legislature has power to provide by law for such districts and that they do not take property without due process of law or without due compensation (State *v.* Corinne Drainage District, 156 Pac. 921). The Supreme Court of Oregon held that the drainage-district law passed in 1915 repeals that passed in 1913, and that it is not invalid on the grounds of im-

posing a tax without the consent of the legislature, of taking private property for public use without compensation, or of the method of filling vacancies in offices. (State *v.* Nyssa-Arcadia Drainage District.) The Supreme Court of Idaho *in re* Canyon County Drainage District No. 1 *v.* Farmers' Coöperative Canal Co. upheld the law passed in 1915 providing that assessment of benefits could be made against an irrigation canal in a drainage district. No decision has been made as yet involving the constitutionality of a similar provision in the Montana drainage law of 1915.

HIGHWAYS

ANDREW P. ANDERSON

Legislation.—The more important highway developments during the year have been largely of a legislative and economic character. The outstanding feature was the passage of the Federal-Aid Road Act, approved July 11. This Act authorizes the Secretary of Agriculture to coöperate with the states, through their respective state highway departments, in the construction of rural post roads. No money appropriated by the Act can be expended in any state, however, until its legislature has assented to the provisions of the Act, except that, until the final adjournment of the first regular session of the legislature, the assent of the governor is sufficient. The assent of the State implies its acceptance of all the terms of the Act, and also pledges its good faith to meet the Federal appropriations dollar for dollar throughout the entire five-year period covered by the Act. The duty of maintaining the roads is placed upon the states or their civil subdivisions, in accordance with the laws of the several states. Since adequate funds for construction and maintenance must be available, and the state must have a highway department with which the Secretary of Agriculture can coöperate, no authority being given him to coöperate in any other manner, the assent of the governor will not alone make active operations possible. The Secretary of Agriculture is charged with the duty of seeing that the money appropriated by Congress is efficiently expended, and to that end it is required that definite systems of road building for the period covered by the Act must be agreed upon before any work can be undertaken, and that ample provision be made by the states or their civil subdivisions for the maintenance of the roads, as required by the Act. The roads to be improved are selected by the state highway department of each state and approved by the Secretary of Agriculture. For carrying out the provisions of this Act, Congress appropriated $75,000,-

APPORTIONMENT OF FUNDS UNDER THE FEDERAL AID ROAD ACT

State	1917	Total for Five Years
Alabama	$104,148.90	$1,562,233.50
Arizona	68,513.52	1,027,702.80
Arkansas	82,689.10	1,240,336.50
California	151,063.92	2,265,958.80
Colorado	83,690.14	1,255,352.10
Connecticut	31,090.44	466,356.60
Delaware	8,184.37	122,765.55
Florida	55,976.27	839,644.05
Georgia	134,329.48	2,014,942.20
Idaho	60,463.50	906,952.50
Illinois	220,926.23	3,313,893.45
Indiana	135,747.62	2,036,214.30
Iowa	146,175.60	2,192,634.00
Kansas	143,207.40	2,148,111.00
Kentucky	97,471.91	1,462,078.65
Louisiana	67,474.66	1,012,119.90
Maine	48,451.50	726,772.50
Maryland	44,047.22	660,708.30
Massachusetts	73,850.95	1,107,764.25
Michigan	145,783.72	2,186,755.80
Minnesota	142,394.06	2,135,910.90
Mississippi	88,905.84	1,333,587.60
Missouri	169,720.41	2,545,806.15
Montana	98,287.19	1,474,307.85
Nebraska	106,770.81	1,601,562.15
Nevada	64,398.30	965,974.50
New Hampshire	20,996.62	314,949.30
New Jersey	59,212.68	888,190.20
New Mexico	78,737.81	1,181,067.15
New York	250,720.27	3,760,804.05
North Carolina	114,381.92	1,715,728.80
North Dakota	76,143.06	1,142,145.90
Ohio	186,905.42	2,803,581.30
Oklahoma	115,139.00	1,727,085.00
Oregon	78,687.37	1,180,310.55
Pennsylvania	230,644.17	3,459,662.55
Rhode Island	11,665.71	174,985.65
South Carolina	71,807.64	1,077,114.60
South Dakota	80,946.02	1,214,190.30
Tennessee	114,153.48	1,712,302.20
Texas	291,927.81	4,378,917.15
Utah	56,950.15	854,252.25
Vermont	22,844.47	342,667.05
Virginia	99,660.71	1,494,910.65
Washington	71,884.28	1,078 264.20
West Virginia	53,270.46	799,056.90
Wisconsin	128,361.07	1,925,416.05
Wyoming	61,196.82	917,952.30
Total	$4,850,000.00	$72,750,000.00

STATE HIGHWAY EXPENDITURES, 1915

	Source of Funds		Expenditures			State Funds Available, 1916	Local Expenditures Not Under State Highway Department (Approximate)
	State	Local	Road Construction	Bridge Construction	Maintenance of Roads and Bridges		
Alabama	$126,134	$172,613	$259,360	$22,660	.....	$144,000	$3,984,450
Arizona [1]	476,178	.....	290,947	87,012	$24,984	450,000	600,000
Arkansas	25,000	[2] 478,000	478,000	.....	.....	60,000	2,300,000
California [3]	8,301,149	.....	7,021,375	[3]	[3]	4,000,000	[4] 12,452,132
Colorado	203,000	370,000	553,900	[5]	9,000	650,000	1,620,000
Connecticut	2,084,944	150,000	1,243,064	1,825	803,989	1,750,000	1,250,000
Delaware	31,000	31,500	60,000	.....	.....	31,000	335,000
Florida	1,135	.....	.....	.....	.....	12,000	5,500,000
Georgia	.....	.....	.....	.....	.....	.....	3,700,000
Idaho	200,000	274,636	329,873	78,017	2,343	100,000	1,500,000
Illinois	818,638	945,357	1,582,594	28,120	11,884	1,000,000	7,500,000
Indiana	.....	.....	.....	.....	.....	.....	13,000,000
Iowa [6]	80,935	.....	.....	.....	.....	110,000	13,525,364
Kansas	10,000	.....	.....	.....	.....	10,000	5,500,000
Kentucky	573,715	548,715	929,965	121,083	.....	750,000	2,000,000
Louisiana	144,821	424,889	363,091	157,066	13,253	150,000	3,000,000
Maine	1,009,345	409,556	1,101,699	46,160	170,468	1,050,000	1,875,000
Maryland [7]	3,330,000	300,000	3,106,000	[5]	379,000	2,000,000	2,000,000
Massachusetts	2,634,567	602,712	1,910,572	[5]	1,026,222	3,184,000	3,320,000
Michigan	975,000	2,349,738	3,069,125	89,303	104,908	975,000	6,850,000
Minnesota	1,580,000	2,462,000	2,684,500	592,000	500,000	1,500,000	4,250,000
Mississippi [8]	.....	.....	.....	.....	.....	5,000	2,900,000
Missouri	369,189	.....	211,119	.....	140,828	350,000	8,000,000
Montana	18,346	.....	.....	.....	.....	20,000	3,657,972
Nebraska	120,000	.....	[9] 32,500	87,500	.....	90,000	3,400,000
Nevada	.....	.....	.....	.....	.....	.....	250,000
New Hampshire	666,339	447,084	569,367	36,184	449,906	600,000	1,250,000
New Jersey	1,163,308	4,000,275	721,436	63,288	[10] 4,113,763	1,800,000	2,000,000
New Mexico	152,122	47,788	152,279	29,899	.....	500,000	385,000
New York	13,983,769	2,521,879	10,721,316	87,308	4,015,136	17,000,000	[11] 7,750,000
North Carolina	10,000	.....	.....	.....	.....	10,000	5,500,000
North Dakota	.....	700	.....	.....	.....	.....	2,500,000
Ohio	3,442,604	3,442,604	5,733,269	207,285	804,753	2,000,000	6,090,480
Oklahoma [12]	10,000	.....	.....	.....	.....	200,000	3,400,000
Oregon	230,000	410,000	620,000	[5]	.....	240,000	5,542,000
Pennsylvania	6,541,257	[13] 745,171	986,893	156,803	4,673,462	4,730,000	6,000,000
Rhode Island	204,119	.....	32,938	.....	141,748	500,000	390,000
South Carolina	.....	.....	.....	.....	.....	.....	1,000,000
South Dakota	.....	.....	.....	.....	.....	.....	1,450,000
Tennessee	3,500	.....	.....	.....	.....	125,000	3,500,000
Texas	.....	.....	.....	.....	.....	.....	9,500,000
Utah	121,000	342,100	257,500	67,400	39,900	150,000	750,000
Vermont	485,145	265,000	435,000	5,145	275,000	445,000	725,000
Virginia	526,645	1,718,754	1,891,302	189,140	.....	630,000	1,773,000
Washington	1,435,020	1,235,683	2,258,337	[5]	273,729	1,500,000	4,000,000
West Virginia	9,212	.....	.....	.....	.....	10,000	2,750,000
Wisconsin	1,389,515	3,071,465	3,708,000	517,163	.....	1,049,000	5,500,000
Wyoming	5,000	.....	.....	.....	.....	.....	436,291
Total	53,491,651	27,768,219	53,315,321	[14] 2,670,361	[14] 17,974,276	49,880,000	186,461,689

[1] Data for fiscal year. [2] Expenditure of special improvement districts under supervision of state highway department. [3] No information obtainable as to distribution of $1,279,774 reported as expended for other work than construction. [4] Does not include San Francisco County. [5] Included under roads. [6] Does not grant money aid but commission has supervisory powers over all road and bridge work in state. [7] Data approximate. [8] State highway department established March, 1916. [9] Special appropriation for road adjoining State University farm. [10] Includes extraordinary repairs and reconstruction made necessary by heavy trucking. [11] Includes $1,877,055 state aid to towns. [12] One-fourth mill state road tax authorized 1915, but did not become available until 1916. [13] Reimbursements to state treasury for state-aid roads. [14] Partial.

000, of which $5,000,000 is made available for the fiscal year 1917, and a sum increasing annually by $5,000,000 for each of the following years until 1921, when $25,000,000 will be available. Three per cent. of the appropriation is available for administration and overhead expenses, and the remainder is apportioned to the several states on the basis of population, area, and mileage of rural delivery routes and star routes, each having a weight of one-third. The state must pay at least one-half of the cost

STATE HIGHWAY MILEAGE, 1916

	State and State-aid Roads Built in 1915	Roads Maintained with State aid, 1915	Total All State and State-aid Roads Built to Jan. 1, 1916	Total All Surfaced Roads in State (Approximate)	Total All Public Rural Roads in State	Percentage of Surfaced Roads in State
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	
Alabama	178	.....	577	5,915	55,446	10.7
Arizona	55	165	302	350	12,075	2.9
Arkansas	[1] 154	.....	154	1,200	50,743	2.3
California	527	[2] 1,000	1,651	13,000	61,038	21.3
Colorado	1,200	300	[3] 5,200	1,750	39,691	4.4
Connecticut	163	1,386	1,445	3,200	14,061	22.7
Delaware	10	.....	154	300	3,674	8.0
Florida	.....	.....	.....	3,500	17,995	19.4
Georgia	.....	.....	.....	13,000	84,770	15.3
Idaho	[4] 193	100	293	950	23,109	4.1
Illinois	184	115	468	11,000	94,141	11.7
Indiana	.....	.....	.....	27,000	63,370	42.6
Iowa	.....	.....	.....	1,000	106,847	1.0
Kansas	.....	.....	.....	1,250	111,536	1.1
Kentucky	800	.....	800	13,000	57,916	22.1
Louisiana	115	64	592	2,250	24,562	9.1
Maine	246	956	1,569	3,000	25,528	11.7
Maryland	248	1,049	1,226	2,950	16,458	17.9
Massachusetts	200	1,025	1,859	8,800	18,681	46.6
Michigan	757	2,438	3,194	8,600	74,089	11.6
Minnesota	[5] 2,000	10,000	6,242	5,500	93,500	5.9
Mississippi	.....	.....	.....	2,500	45,778	5.5
Missouri	[6]	9,000	[6]	8,000	96,124	8.3
Montana	.....	.....	.....	775	39,204	2.0
Nebraska	3	.....	3	500	80,338	.6
Nevada	.....	.....	.....	75	15,000	.5
New Hampshire	152	1,154	1,176	1,800	14,020	12.8
New Jersey	58	2,432	1,988	4,600	14,817	31.0
New Mexico	350	.....	707	450	11,873	3.8
New York	1,083	5,926	6,250	17,500	80,112	21.8
North Carolina	.....	.....	.....	6,500	50,758	12.8
North Dakota	.....	.....	.....	1,100	68,000	1.6
Ohio	359	905	928	30,920	86,453	35.8
Oklahoma	.....	.....	.....	300	107,916	.3
Oregon	65	.....	374	7,780	36,819	21.1
Pennsylvania	74	8,529	1,963	9,883	91,556	10.8
Rhode Island	10	325	325	1,246	2,121	58.8
South Carolina	.....	.....	.....	3,500	42,220	8.3
South Dakota	.....	.....	.....	850	96,306	.9
Tennessee	.....	.....	.....	8,625	46,050	18.7
Texas	.....	.....	.....	12,000	128,960	9.3
Utah	394	[5]	.....	1,053	15,000	7.0
Vermont	200	4,000	1,831	3,478	15,082	23.1
Virginia	847	.....	3,763	4,760	53,388	8.9
Washington	533	[2] 900	1,557	5,460	42,428	12.8
West Virginia	.....	.....	.....	1,200	32,024	3.7
Wisconsin	[7] 1,279	.....	3,911	14,050	75,702	18.5
Wyoming	.....	.....	.....	500	14,381	3.5
Total and averages ..	12,437	51,769	50,402	276,920	2,451,660	11.3

[1] Only engineering and supervision furnished by state. [2] Approximate. [3] Includes about 4,500 miles of grading. [4] 240 miles additional under construction. [5] No data. [6] Of this, 361 miles surfaced; remainder, turnpike and grading. [7] Includes 648 miles of grading.

of all the roads improved from Federal aid, and in addition, it, or its civil subdivisions, according to its laws, must maintain these roads after they are constructed. Under the same Act $1,000,000 a year for ten years is appropriated for the construction and maintenance of roads and trails in, or partly within, the national forests, in coöperation with the state, territory, or county, upon a basis equitable to both parties. The Federal funds apportioned to each state under the Federal-Aid Road Act for the fiscal year 1917, and the approximate total apportionment to each state for the entire five-year period are shown in the table on page 284.

Two states, Mississippi and Georgia, established state highway depart-

ments during the year. The powers of each, however, are limited almost entirely to duties of an advisory and educational nature.

Construction.—More funds have been available for road building, and especially maintenance, than ever before, but it is doubtful if the amount of new construction completed in 1916 will equal that of 1915, for two reasons: first, the scarcity and high cost of labor and materials, and, second, the large amount of repair and renewal made necessary by floods in various localities. The cost of materials and labor has in many sections increased from 25 to 50 per cent. above the average of the two preceding years

Mileage, Appropriations and Expenditures.—The accompanying tables adapted from the U. S. Department of Agriculture Circular No. 63, prepared by the Division of Road Economics, Office of Public Roads and Rural Engineering, give the state and local expenditures, mileage, etc., more fully than can be expressed in any other form. The value of the convict labor and statute labor, which is estimated at a grand total of $15,000,000 for the entire United States, is not included in these tables.

WATERWAYS AND HARBORS

T. W. Van Metre

Appropriations.—For the first time in three years Congress passed a Rivers and Harbors Appropriation Act containing appropriations for specific projects of improvement, the Appropriation Acts of 1914 and 1915 having provided for lump sums to be distributed among various works of improvement according to the wishes of the Army engineers. The Act approved July 27, 1916, carried a total appropriation of $40,598,135, which, with an appropriation of $1,482,800 carried in the Sundry Civil Appropriation Act approved July 1, made the entire river and harbor appropriations for the year $42,080,935. The total appropriations for river and harbor improvement since the establishment of the Government, including permanent annual appropriations, amount to $898,543,252.47. During the fiscal year ending June 30, 1916, the Federal Government expended $34,846,496.10 on river and harbor improvement work. There has been a great deal of agitation for, but no progress towards, a modification of the present methods of appropriating government funds for waterway improvement.

Boston.—The chief work now being done by the Federal Government at Boston is that of deepening the Weymouth Fore River. The Rivers and Harbors Act carried an appropriation of $200,000 for the continuation of this work and for the removal of the shoal south of the west end of Peddocks Island. The directors of the Port of Boston are carrying on the work for the improvement of the terminal facilities of the port according to the plan described in the Year Book for 1915 (p. 293).

Providence.—The state of Rhode Island has constructed at Providence a new $2,000,000 pier which has brought an addition to the trans-Atlantic service of the port. The 30-ft. channel extending from deep water in Narragansett Bay to Field's Point, a distance of nine miles, was completed in May.

New London.—The large state pier at New London, Conn., has been completed, giving this port one of the best equipped and largest piers in New England.

New York.—The Federal Government is carrying forward the extensive work of improvement under way in all the waterways around New York Harbor. The Hudson River channel adjacent to the New Jersey shore is being deepened, the remaining dangerous shoals are being removed from the East River, the Harlem and Bronx Rivers are being dredged to a greater depth, and the channels to various parts of the port along Long Island, the Bay Ridge and Red Hook Channels, are being deepened and widened. One of the most important projects for the improvement of the terminal facilities of the port of New York is that having to do with the reconstruction and elevation of the line of the New York Central Railroad on the west side of Manhattan Island. Several plans for

this undertaking are being considered, though no definite scheme has been adopted.

The New Jersey cities adjacent to the waters of New York Harbor are steadily improving their facilities for water-borne traffic. The Newark improvement, a description of which was given in the YEAR BOOK for 1915 (p. 294), is well on the way to completion. The Kill Van Kull, which affords a passage from Newark Bay to Upper New York Bay, has a depth of 30 ft., and Staten Island Sound (Arthur Kill), which gives an outlet from Newark Bay to Raritan Bay and Lower New York Bay, is being dredged and deepened. The Rivers and Harbors Act contained an appropriation of $500,000 for the continuation of this work.

The city of Bayonne, in conjunction with private interests, is planning the construction of a great $10,000,000 marine terminal to be located just south of the Greenville yards of the Pennsylvania Railroad. If the proposed plan is carried out, some 250 acres of low land will be reclaimed, on which will be constructed bulkheads, platforms, pier sheds, warehouses, factories, cold-storage plants, elevators, coaling plants, power house, railroad tracks, and all the equipment of the modern ocean terminal. The project resembles in many features the great Bush Terminal in Brooklyn, and, if completed, will add greatly to the facilities for handling the growing commerce of New York Harbor.

The New Jersey cities are attempting to add to their commercial advantages by asking the Interstate Commerce Commission to require the railroads to give lower freight rates to the cities on the New Jersey shore than are given to New York City. For many years the charges to all the cities surrounding New York Harbor have been the same, the railroads having adopted the custom of absorbing the lighterage charges on the traffic transferred from various rail terminals to the water terminals on Manhattan Island and in Brooklyn. This absorption of lighterage charges the New Jersey cities assert to be a discrimination against them, and they are seeking a lower rate than that given to New York.

Philadelphia.—The 35-ft. channel of the Delaware River is virtually completed as far as Reedy Island, just below Newcastle, Del. When finished the channel will extend from Philadelphia to Bombay Hook, where Delaware Bay commences. The entire project of improvement of the channel is about 40 per cent. completed. The Rivers and Harbors Act sets aside $2,165,000 for the continuation of the work and authorizes the Secretary of War to enter into contracts for work necessary further to prosecute the project to the extent of $600,000, to be paid for out of subsequent appropriations.

By popular vote the city of Philadelphia was authorized on May 16 to borrow $67,100,000, to be used for public improvements of various kinds. Of this sum $13,000,000 is to be spent on port improvement. New piers are to be constructed at once near Kenilworth and Cherry Streets, just opposite the active business center of the city; the Schuylkill River is to be dredged and bulkheaded, and several more large public piers constructed. The superstructure of the recently built pier at McKean Street is virtually completed, and work is well under way on the group of Moyamensing piers along the South Philadelphia section of the Delaware waterfront.

New terminal facilities are being provided at other ports of the Delaware. The city of Trenton is improving its waterfront, private corporations are constructing new piers and building new bulkheads at Chester, and the Baldwin Locomotive Works is straightening and widening the channel of the Crum River preparatory to installing terminal facilities for water transportation. The government iron pier at Lewes is being improved, and will be open to public use.

South Atlantic Ports.—The 28-ft. channel from Charleston Harbor to the sea is almost completed. The city of Charleston has done very little toward the improvement of the waterfront, practically all of the wharf and pier facilities being under the control of private dock companies and railroads.

The Rivers and Harbors Act carries an appropriation of $545,000 for the

maintenance and completion of the improvement of the harbor of Savannah. This city too has done little in the way of providing municipal terminals for its shipping.

Saint Johns River, Florida, is being dredged to a depth of 30 ft. to accommodate the commerce of Jacksonville, situated 27.5 miles from its mouth. Jacksonville in recent years has done a great deal toward the improvement of its port. With the proceeds of a bond issue of $1,500,000 voted in 1913 the city has purchased a tract of land along the river, having a frontage of 4,200 ft. and a depth of 700 ft., where new piers have been erected together with warehouses and railway facilities.

The harbor of refuge at Cape Lookout, North Carolina, is about one-third completed.

Gulf Ports.—The maintenance of deep water in the passes of the Mississippi River continues to be an expensive task, the Government appropriating in 1916 the sum of $1,000,000 for that purpose and for the continuation of the dredging.

The great sea wall of Galveston, which protects the city from the waters of the Gulf of Mexico, is to be extended at the joint expense of the Federal Government and the city. The maintenance of the harbor channel and the channel to Texas City demand the expenditure of almost a half-million dollars each year.

Pacific Ports.—No city in the country has made more substantial progress in port improvement in recent years than Los Angeles. When the small harbor towns of San Pedro and Wilmington were annexed by Los Angeles in 1909, it was agreed that the city should expend $10,000,000 on harbor development. More than half of this sum has been spent. Part of the money has gone for dredging work in the outer and the inner harbor, part has been used for the reclamation of low land, and part has been spent for the construction of piers, several of which, with all modern equipment, have been completed and put in service. The city has also established a fish wharf, upon which space has been rented to fish-canning companies.

The canal connecting Puget Sound with Lake Washington is almost finished. The lock is completed and in operation, and Seattle is now provided with both a salt-water and a fresh-water harbor for ocean vessels.

River Improvement.—The Federal Government is continuing the improvement of the Hudson River, in order to make it available to the fullest extent for the traffic which is expected to use the new New York State Barge Canal. The dam and lock at Troy have been finished and were opened to navigation on May 8. This work, built at the expense of the Federal Government at a cost of $1,500,000, replaces the old state dam and lock constructed by New York State. The lock affords access to the new Barge Canal. Troy has been authorized to create a harbor and dock commission, which will be empowered to purchase land and construct terminal facilities to enable Troy to take advantage of the commercial opportunities furnished by the canal and the Hudson River improvements.

The Ohio River improvement is probably the most important work of river improvement, from a commercial standpoint, now being carried on by the Federal Government. In 1910 Congress adopted a plan for work which, when finished, will give the Ohio River a minimum depth of nine feet from Pittsburgh to the mouth of the river. Of the 53 locks and dams for which the plan provides, 16 were completed and in operation on July 1, 18 more were in the process of construction, while 19 were yet to be commenced. It is not known when the entire work, which it is estimated will cost $63,000,000, will be finished. When the project was adopted it was intended that it should be completed within a period of 10 years, but appropriations have not been made rapidly enough to insure completion within that time. The Rivers and Harbors Act of 1916 provides $5,509,500 for the continuation and maintenance of the work.

Nearly $8,000,000 was appropriated in 1916 for the continuation of the improvement work on the Mississippi River, and large sums were provided also for the Trinity, Brazos, Cumberland and Tennessee Rivers.

The construction of the jetties at the mouth of the Columbia River is

advancing rapidly, and $1,200,000 was appropriated to carry on that work.

The fourth lock at St. Mary's Falls was 27 per cent. completed on July 1. The sum of $800,000 was appropriated in the Rivers and Harbors Act for this project, and $500,000 provided for in the Sundry Civil Act.

Artificial Waterways.—The enormous increase of the volume of freight transported within the country during the past 18 months and the consequent shortage of freight cars (see XIII, *Economic Conditions*) have combined to stimulate active interest in the possibilities of transportation by inland waterways. Greater activity has been shown on the Mississippi River and its tributaries, and canal transportation also has increased. An interesting revival was the institution in May of a power-barge service between Philadelphia and New York *via* the Delaware and Raritan Canal.

The funds provided for the New York State Barge Canal by the popular approval of a bond issue on Nov. 2, 1915 (*A. Y. B.*, 1915, p. 296), became available for use during the early part of the year, and as a result the Barge Canal is well on the way toward completion. The spring of 1918 should witness the opening of the great new system throughout its entire length. The terminal sites acquired in New York City and at other cities along the route are being improved by the construction of dock walls and warehouses and by the installation of freight-handling machinery. The state engineer has advised the creation of a state traffic bureau, whose duty it will be to give information concerning rates and service on the canal and to encourage the use of the new system of waterways.

Docks are being constructed at Port Henry, near the southern end of Lake Champlain, to be used for handling iron ore of the Champlain district. A rate of 50 cents per ton to New York, *via* the Champlain branch of the canal, will enable this ore again to become a factor in the iron market.

The Board of Harbor and Land Commissioners of Massachusetts is conducting an investigation to determine the advisability and practicability of the acquisition of the Cape Cod Canal by the state.

The Federal Government is continuing the work of improving the inland waterway along the Atlantic coast south of Norfolk. The sum of $1,000,000 was appropriated for the branch from Norfolk to Beaufort Inlet. Generous appropriations were made also for the maintenance of the coastal waterways along the Gulf of Mexico. (See also XX, *Inland Waterways.*)

Panama Canal.—The great slide which filled the channel of the Panama Canal in the Gaillard Cut on Sept. 18, 1915, caused the Canal to remain closed to navigation until April 15, at which time 16 vessels were permitted to pass through. After that date a 30-ft. depth was maintained in the channel except for the week from Sept. 30 to Aug. 7, when a movement of the Cucaracha slide caused the interruption of navigation by all vessels drawing more than 17 ft. In spite of the ominous reports which have been circulated from time to time concerning the condition of the Canal, General Goethals asserts that it will be but a short time before the danger of stoppage of traffic by slides will be entirely eliminated.

The construction of terminal facilities at each end of the Canal has been vigorously prosecuted. Coaling plants and new piers have been placed in service and the 1,000-ft. drydock at the Pacific terminal has been opened to commercial use.

Because of the interruption of traffic the amount of tolls collected for the use of the Canal during the fiscal year ending June 30, 1916, was much less than the amount collected from the date of the opening of the Canal, Aug. 15, 1914, to June 30, 1915. The total collections for the year were $2,399,832.42. The expenses of operation and maintenance were $6,999,750.15, leaving an operating deficit of $4,599,919.13, as compared with an operating surplus of $276,656.38 for the preceding year. More than half of the operating and maintenance expense was paid out for dredging in the section blocked by slides. (See also XX, *Merchant Marine.*)

Major-Gen. George W. Goethals resigned as Governor of the Panama Canal Zone on June 1. Lieut.-Col. Chester Harding was confirmed as Governor on Jan. 8, 1917.

XI. PUBLIC SERVICES

Richard C. Harrison

PUBLIC SERVICE COMMISSIONS

Reorganization of the New York City Commission.—The year 1916 was not active so far as legislation effecting public-service commissions was concerned. Owing to the practice of holding biennial sessions in the majority of the states, few legislatures met during 1916 and few statutes of importance resulted. (See also XX, *Railroads.*)

The chief event of the year was the complete reorganization of the Public Service Commission having jurisdiction in New York City. As noted in the Year Book for 1915 (p. 299), the Commission was subjected to an inquisitorial legislative investigation headed by Senator George F. Thompson. Although the investigation itself eventually degenerated into a positive abuse of legislative powers, yet it was of value to the state in bringing to light a most astounding condition in the New York City Commission. Late in 1915 sufficient proof was presented to Governor Whitman concerning the acts of Chairman Edward E. McCall to justify his removal from office. One of the most serious charges presented was that he was the record holder of stock in certain companies regulated by the Commission. He was removed from office on Dec. 6, 1915, and on Dec. 20 the Governor appointed Oscar S. Straus, former Secretary of Commerce and Labor and ex-Ambassador to Turkey, as chairman of the Commission. Mr. Straus was a prominent member of the Progressive party, having been its candidate for governor of the state. Subsequent to the removal of Chairman McCall, the Thompson Committee continued its investigations, and it was not long before the most grave charges were under investigation concerning the manner in which Commissioner Robert C. Wood had obtained his appointment to the Commission. The two remaining commissioners, J. Sergeant Cram and George V. S. Williams, were also under investigation for neglect of duty and incompetence. Commissioner Wood resigned under charges on Jan. 6, 1916, the Governor accepting his resignation on the theory that the acts charged against him, if proven, were criminal in their nature and could best be tried before the courts. In place of Commissioner Wood the Governor appointed Henry W. Hodge, an engineer of national reputation, who had largely specialized in bridge construction work. Mr. Hodge is the first engineer appointed to the New York City Commission. The term of J. Sergeant Cram expired by limitation on Feb. 1. Commissioner Williams decided that his usefulness had been largely impaired because of the investigation and tendered his resignation to take effect on Feb. 1. This gave the Governor two appointments, which he filled by the naming of Travis H. Whitney and Charles S. Hervey. Mr. Whitney had been secretary of the Commission since its establishment under Governor Hughes. Mr. Hervey was a deputy comptroller of the City of New York who had been of considerable assistance to the Governor in connection with the working out of problems of state budget-making. Senator Thompson vigorously opposed the confirmation of Mr. Whitney, alleging that as he had been secretary of the Commission during the

entire term of office of the commissioners who had been removed, and, as he was very largely the executive office head of the Commission, he was in a measure responsible for the conditions which existed. The confirmation of both Mr. Whitney and Mr. Hervey was held up in the Senate for several weeks, but both were confirmed eventually and took office on March 17. With their confirmation Governor Whitman completed the extraordinary experience of having been privileged to appoint the full membership of the Public Service Commission for the First District during his term of office.

The Thompson Committee recommended a number of changes in the public-service commissions law and introduced bills into the legislature to carry them into effect. The most important change recommended was the severing of the regulative functions of the First District Commission from its rapid-transit construction functions, with a transfer of the latter to a local city commission of seven members to be appointed by the mayor of New York. This recommendation, although logical, was opposed by Mayor John Purroy Mitchel on the ground that extremely important subway construction contracts were under way and that it would mean an undue disturbance of existing conditions to make a transfer at the present time. The measure was defeated in the legislature.

One important change was made during the year in the method of financing the New York City Commission. Although the state has paid all of the expenses of the Second District Public Service Commission, it has paid only the salaries of the commissioners, chief counsel, and secretary of the New York City body, all of the balance of the expenses being paid by the City. On the urgent appeal of Mayor Mitchel, as part of his financial programme, the legislature agreed to separate the expenses of the First District Commission, imposing those expenses which are connected with regulation upon the state, leaving for the city the carrying of expenses connected with the construction of rapid-transit lines. (Laws of 1916, Chapter 572.)

Public Service Commissions and Labor Disputes.—It is curious that in none of the statutes creating public-service commissions is any account taken of the possibility of using these bodies as arbitrators in disputes between public-service corporations and their employees. Neither the statutes themselves nor the reports of the state commissions, with but few exceptions, show any appreciation of the possibility of using the commissions as valuable aids in preventing the serious public inconvenience and loss which inevitably result from strikes on public-utility plants. There were two notable cases in 1916 in which commissions demonstrated their possibilities of usefulness along these lines.

In the early summer differences arose between the employees of certain of the street railways in New York City and the operating companies which for a time threatened to develop into one of the most serious traction strikes in the history of the city. Mayor Mitchel and Chairman Straus of the Public Service Commission tendered their services as mediators and were successful in bringing the companies and their employees together under an agreement which was mutually satisfactory and which avoided the strike, at least for a time. Although subsequent differences arose which could not be so settled, the strike which followed was far less serious than was at first anticipated and it was promptly and effectively handled by the local authorities. (See also XVI, *Labor.*)

In March, 1916, after a strike on the Washington Railway and Electric Co., the District of Columbia Commission was made a board of arbitrators to adjust the differences. The Maryland Public Service Commission also reports a successful arbitration between the Cumberland and Westernport Electric Railway Co. and its employees. It seems highly probable that these examples of effective public service by the commissions in settling disputes between capital and labor will have considerable influence in establishing legislation to extend greatly the statutory powers of the various state commissions in this direction.

MUNICIPAL OWNERSHIP

Progress of Municipal Ownership.—There has been a steady, although by no means unusual, extension of municipal ownership throughout the United States during 1916. The report of the Federal Census Bureau for the fiscal year ending June 30, 1915, shows that it is the overwhelming practice in large communities to municipalize the water systems. This matter is commented upon more in detail under the notes on "Water Supply" (*infra*).

Chattanooga.—The city of Chattanooga, Tenn., has obtained an option to purchase the waterworks system under private ownership subject to appraisal of its value. During the year the value was agreed upon as $2,600,000. The city council decided, however, that the price was prohibitive and acted unfavorably upon the proposition to purchase. Under the agreement between the city and the company this postpones the possibility of acquisition of the plant by arbitration until 1921.

Dallas.—On April 4, 1916, by vote of 3,926 to 3,859, the city of Dallas, Tex., authorized the issue of $500,000 in bonds for the construction of a municipal electric plant to furnish both private and city lighting. This appropriation carried with it a cancellation of a former appropriation of $400,000 made in 1914 for the construction of a municipally owned plant intended solely for the purpose of furnishing current for street and public lighting.

At the same election a charter amendment was approved providing for the granting of determinate franchises to public-utility companies for not exceeding 20 years, provided they contain a reservation to the city of the right to purchase the properties at the expiration of the franchise or the right to cause them to be purchased by the new grantee. Provision was also made for indeterminate franchises with a provision that in lieu of tax on gross receipts it might be provided that the city grant a franchise with provision for "service at cost."

Dunkirk, N. Y.—At a special election held in Dunkirk, N. Y., in August a proposal to issue $200,000 in bonds for an extension to the municipal electric-lighting plant was defeated.

Durham, N. C.—During the year the city of Durham, N. C., decided to purchase the plant of the Durham Water Co. for $325,000. Every city and town in the state, of 5,000 population or over, except Oxford, now owns its water-supply plant.

Fort Worth.—On Jan. 6 a proposition to appropriate $500,000 for a municipal waterworks in Fort Worth, Tex., was defeated by a close vote. Upon a petition signed by over a thousand voters the question was again submitted later in the month and defeated a second time, the vote being 1,554 in favor to 1,584 opposed.

Kalamazoo.—At a special election held in Kalamazoo, Mich., to consider a proposed appropriation of $350,000 for a municipal lighting plant, the project was defeated by 111 votes. A three-fifths majority was required under the city charter to secure approval.

Milwaukee.—On April 4, by a vote of 29,489 to 10,894, Milwaukee appropriated $750,000 for the construction of a municipally owned street-lighting distributing system. This amount will be sufficient to equip about half the city. The proposition was strongly opposed by the local lighting company, which carried on an elaborate publicity campaign in its effort to persuade the voters that the measure was expensive and unnecessary.

New Orleans.—During the year New Orleans investigated the advisability of constructing a municipal lighting plant. A commission, consisting of F. W. Ballard of Cleveland, Foster Olroyd and Alfred Raymond, reported that it would not be practicable to operate a municipal plant successfully in competition with existing private companies. The project was therefore abandoned for a time at least.

Perth Amboy.—In July Perth Amboy, N. J., completed its new municipal light, heat and power plant which will serve private consumers as well as the municipality.

San Francisco.—A very interesting question of franchise law and interpretation has arisen in San Francisco in connection with the attempt of the city to parallel certain street-railway tracks of the United Railroad Co. with tracks of the municipally owned line. In the company's franchises there is a provision against such paralleling under subsequent franchise grants for over five blocks. The company contends that the prohibition applies equally to city-owned and constructed tracks. An attempt to lay city tracks on Market Street was stopped in June by injunction and the question is now being litigated. Meanwhile a large portion of the city's railway must lie idle because of the impossibility of completing it while restrained by the courts. The road continues to prosper and apparently meets with popular approval. During the year it was supplemented with a municipal automobile service across Golden Gate Park.

During the year the city began negotiations for the purchase of the Spring Valley Water Co. and proceedings were initiated before the State Railroad Commission to value the plant as a preliminary to active negotiations for its purchase.

Wheeling.—On March 31 Wheeling, W. Va., discontinued operation of its municipal gas plant because of losses estimated as averaging $1,000 per month. The city was compelled to meet the competition of private companies furnishing natural gas, and its efforts to prevent this having been defeated in the courts, it was decided to close the city's plant.

Kansas.—There has been a marked increase in the municipal-ownership movement in Kansas during the year. Several cities and towns have taken action looking to the acquisition or construction of one or more public utilities. Emporia appropriated $75,000 for a municipal water plant. Fort Scott decided to construct a municipal lighting plant. Ottawa and Perry adopted plans for a municipal lighting plant. Pratt decided to municipalize both lighting and ice-manufacturing plants. Yates Center appropriated $500,000 for municipal waterworks.

Kentucky.—By Chapter 54 of the Laws of 1916 cities throughout the state of Kentucky are authorized to sell water and light to other cities in the same manner as a private corporation or an individual may acquire such franchise.

Mississippi.—By Chapter 148 of the Laws of 1916 cities in Mississippi of 5,000 and over are permitted to purchase or construct electric-light plants, gas or waterworks provided "that the income or saving or both to the municipality arising from the operation of such plants will in ten years equal the investment in the plant."

By Chapter 149 of the Laws of 1916 municipalities are permitted to supply water to consumers within three miles of the corporate limits at a rate not more than 25 per cent. in excess of that charged to their own citizens.

LIGHTING

Rate Making.—The chief interest in the field of public lighting continues to be the numerous disputes between lighting companies and the communities which they serve in the matter of rates for both gas and electricity. During the year a number of cities have secured substantial reductions, some with the assistance of the state public-service commissions and others through voluntary act of the service companies.

A novel and interesting method of testing the validity of rate making by legislation appeared in New York City. The State Legislature fixed the rates to be charged by the Brooklyn Borough Gas Co., which serves a portion of the Borough of Brooklyn, at 80 cents a thousand cubic feet instead of 95 cents, the rate fixed by the Company, and provided a penalty of $1,000 for each failure to comply with the statute. After accumulating penalties amounting to $28,000,000 the Company voluntarily petitioned the district attorney to begin an action on behalf of the State to recover. This case is interesting also because of the fact that although the Public Service Commission had full power to investigate rates and establish

them, in this particular instance the Commission itself favored the passage of mandatory legislation establishing the rates arbitrarily.

Baltimore.—Seventy-five cent gas went into effect in Baltimore on Jan. 1, 1916.

Columbus.—On June 12 the City Council of Columbus, O., passed an ordinance, effective July 12, reducing the rate for gas from 30 cents per thousand cubic feet to 25 cents, the lower rate to be established for a five-year period. The Columbus Gas and Fuel Co. and the Federal Gas and Fuel Co. both appealed from the city to the Public Service Commission.

Dayton.—A dispute between the city of Dayton, O., and the local gas company of over a year's standing was finally compromised by a fixing of the rate at 34 cents per thousand cubic feet for four years and at 34½ cents for the following six years. A minimum monthly charge of 34 cents was agreed upon.

El Paso.—The city authorities of El Paso, Tex., decided during the year to abolish overhead electric wires in the business district. The work of removal and of replacing with underground wires was well under way at the close of the year. The estimated cost to the city is $325,000.

Holyoke.—Holyoke, Mass., which is one of the largest manufacturing communities in New England, owns its electrical plant. Owing to the character of the city's business there has been an increasing pressure to lower the rate for power so as to make it readily available for the various industrial plants. Early in the year the rate was fixed at one cent per kilowatt-hour, giving consumers a rate which compares favorably with any in the country.

Lexington, Ky.—The franchise of the local electrical company in Lexington, Ky., expired during the year and the City Council secured expert advice from the Philadelphia Utilities Bureau in drafting a new franchise ordinance. The term was fixed at 20 years and the rates were reduced about 40 per cent. under those formerly allowed, with provision for a revision every four years during the franchise term. The franchise was sold at public auction for $10,000 to the existing company, the only bidder. It became effective on Nov. 1.

Los Angeles.—An interesting example of how far experts may differ in the valuation of public-utility plants was furnished during the year in connection with the valuation of the plant of the Southern California Edison Co. as a preliminary to the possible purchase of a portion of the property by the city of Los Angeles. The Company claimed a value for the portion desired by the city of $21,890,066. The State Railroad Commission divided on the question of value, the majority fixing it at $6,328,000 and the minority at $4,705,000. The case is of considerable interest because of the prominence given to the item of consequential damage due to separation of the plant through city purchase of that portion of it lying within the city limits. In the majority report of the Railroad Commission $1,578,000 was allowed for this damage. The Company claimed a very much higher figure. So far as the practical question of city purchase is concerned, either appraisal is beyond the amount which the city is now authorized to pay. Only $4,800,000 is available for the purpose. The proceeding is reviewed in considerable detail by J. D. Burks, the city director of efficiency, in the May issue of the *Utilities Magazine*.

Minneapolis.—In accordance with a settlement agreed upon in 1913 between the City of Minneapolis and the local lighting company (*A. Y. B.*, 1914, p. 297), the price of gas was reduced on Jan. 1, 1916, to 77 cents per thousand cubic feet, this rate to continue in effect till April 1, 1918. Based upon present consumption this means a saving to consumers of over $70,000 annually.

On March 1, 1916, the electric company made a voluntary reduction in both its domestic and commercial rates, averaging one-half cent per kilowatt-hour. The new rate for domestic current runs from 8½ cents per kilowatt-hour for the first three kilowatt-hours per room to 2½ cents per kilowatt-hour for all use over six kilowatt-hours per room per month. The minimum monthly charge is fixed at one dollar. The commercial rate is to

be seven cents per kilowatt-hour for the first 200 kw. of use and four cents per kilowatt-hour for the excess.

New York.—The Public Service Commission for New York City district, after exhaustive investigation, reduced the rates charged by the Newtown Gas Co. from one dollar per thousand cubic feet to 95 cents per thousand, and the rates of the Woodhaven Gas Light Co., the Richmond Hill and Queens County Gas Light Co. and the Jamaica Gas Light Co. from one dollar to 85 cents per thousand cubic feet. All of these companies serve outlying sections of the Borough of Queens. The principal companies in the city are charging 80 cents per thousand cubic feet under mandatory legislation passed a number of years ago. The Queens County companies have declined to obey the orders of the Commission and in July the Commission's counsel was directed to begin court proceedings to enforce them. On Oct. 27, after four years of investigation, the Commission ordered a reduction of rates by the Brooklyn Edison Co., which will save consumers of electricity in the Borough of Brooklyn over $1,000,000 a year. (See also "Rate Making," *supra.*)

Omaha.—In July Federal Judge Woodrough decided that the franchises of the Omaha Electric Light and Power Co. are perpetual. It is expected that an appeal will be taken to a higher court.

Philadelphia.—The history of the experience of the city of Philadelphia with its lighting problems, both gas and electric, has extended over many stormy years with few instances of benefits obtained by the consumers. The Philadelphia Electric Light Co. has a monopoly of the electrical business and appeared so strongly entrenched that when the Blankenburg administration undertook, in July, 1914, to contest the Company's rates there appeared but slight hope of substantial success. The provisions of the Pennsylvania public-service law are not favorable to the contestants in such cases, throwing the burden of proof upon them without adequate provisions for securing a proper valuation of plant as a basis for the case. The city, however, presented its petition to the Public Service Commission and secured the legal services of Dean W. D. Lewis of the Law School of the University of Pennsylvania and the expert advice of a number of well-known outside authorities. The Company also secured a formidable array of experts and counsel and the contest was long and bitter. After a two-years fight and the production of an enormous mass of conflicting testimony, a settlement was finally reached which was so infinitely more favorable to the city than was expected in the beginning, even by the most sanguine supporters of the city's case, that it constitutes the most notable victory achieved by the Philadelphia public in its whole experience with the lighting companies. In April a compromise schedule of rates was approved which will effect an annual saving in public lighting of $150,000 and in domestic and commercial lighting of not less than $900,000. The city also received a rebate of $195,000 on bills paid during the period of contest. The rates were so adjusted as to allow the Company a return of approximately seven per cent. on an estimated capital investment of $30,000,000. The entire case is interestingly reviewed by Dean Lewis in the May, 1916, issue of the *Utilities Magazine.*

The city has made notable extensions to its street-lighting system during the year. Over 300 new electric lights were added to the equipment of Broad Street, which the authorities now claim is the longest electrically lighted thoroughfare in the country, being over ten miles in length.

Pittsburgh.—According to franchises granted in 1884 the city of Pittsburgh was entitled to a certain amount of free gas for lighting and heating purposes in connection with municipal buildings. The city has contended that the Equitable Gas Co., the present holders of the franchises, was compelled to furnish free gas for all city buildings. By court decision rendered during the year the obligation of the Company was held to be confined to the furnishing of gas for heat for buildings occupied by the police, fire, market, and city-property bureaus.

Providence.—The Narragansett Electric Lighting Co. and the City Council of Providence, R. I., have agreed upon a reduction in rate from ten to nine cents per kilowatt-hour, saving the city annually about $15,500.

Springfield, Ill.—By an order of the Illinois Utilities Commission, effective April 9, 1916, the price of gas in Springfield, Ill., was cut from one dollar per thousand cubic feet to 80 cents. This decision brought to a close a fight extending for over two years. It means a saving to consumers of over $500,000 annually.

St. Louis.—The Union Electric Co. of St. Louis made a voluntary reduction in lighting rates during the year amounting to one-half a cent per kilowatt-hour. The new rate is eight and one-half cents per kilowatt-hour for the first four kilowatt-hours per room per month, with substantial reduction on increased consumption. A minimum monthly charge of 50 cents is established.

Topeka.—One of the liveliest public-utility rate fights of recent years has raged during the year in Topeka, Kans., and other cities served by the Kansas Natural Gas Co. The Company sought the permission of the State Utilities Commission to raise its rate from 25 cents per thousand cubic feet to 35 cents. The Commission fixed it at 28 cents. The Company, which was in the hands of a receiver, according to its statements, largely because of inadequacy of rates, appealed to the Federal courts and secured permission to charge a 35-cent rate in Topeka and a 40-cent rate in Atchison, effective in September.

This victory caused the greatest popular indignation and a citizens' committee was formed with the avowed purpose of inciting consumers to refuse to pay the higher rate. At the same time the Kansas Natural Gas Co. fixed its wholesale rate to the Kansas City Gas Co., and the Wyandotte County Gas Co., the local distributors for the Kansas City district, at 18 cents, which they promptly refused to pay. One result has been the change of public lighting of Kansas City, Kans., to electricity because of inability of the distributing gas companies to obtain gas at a lower rate.

Washington.—The Federal Government, through the War Department, is studying the availability of the Great Falls of the Potomac as a source of light and power for the District of Columbia. Secretary Baker has designated a board of army engineers consisting of Col. H. C. Newcomer, resident member of the Board of Engineers for Rivers and Harbors, Col. C. A. F. Flagler and Lieut. Col. W. W. Harts to investigate and report.

Street Lighting.—There has been a steady increase in the number of communities which have established so-called "white-ways," in most cases very largely in the business districts for advertising purposes. There have been a number of instances during the year where such lighting equipment has been installed by assessment upon abutting property owners. The "white way" movement during the year has spread more rapidly through western cities than in the East, partly due to the stimulus given by the remarkable effect secured at the Panama-Pacific Exposition. At least two large cities have employed the expert who was in charge of the illumination to plan for extensive additions to the municipal lighting systems.

The Exposition showed the citizens of San Francisco the possibilities of artistic illumination. The city employed the Exposition's lighting expert to plan a modified "white way" for the business district. He designed and executed what has been named locally the "Path of Gold." The lighting standards are elaborate and artistic. The lamps are made from an amber glass manufactured in San Francisco, and known as "Gold Carrara." The general effect is said to be extremely pleasing and successful. The completion of the new system was made the occasion of a two-days pageant on Oct. 4 and 5.

In common with San Francisco, Salt Lake City received inspiration from the Panama-Pacific lighting and also employed the Exposition's expert to design a "white way." Work was begun on one of the principal business streets in August, and 200 standards installed. Elaborate ceremonies marked its completion.

The "white way" movement reached

Richmond, Ind., also during 1916 and North 9th Street was equipped with 130 lamps paid for by assessment upon private property along the street. (See also XXI, *Electrical Engineering.*)

WATER SUPPLY

Purification.—There has been a considerable amount of experimentation throughout the country during the year with the chlorination of water to insure its sterility. Interesting and successful experiments have been carried on in the largest cities of California and the State reports at the close of the year that 29 cities are now employing this method of sterilization. In Oakland and San Francisco public swimming pools are treated in this manner as well as the general domestic supply. The city of Orange, N. J., also has been experimenting with the chlorine treatment in an endeavor to save the cost of a filtration plant. Very satisfactory reports have been made by the city of Sacramento, Cal., and by Buffalo, N. Y., as to the reduction in the number of cases of typhoid fever secured by the chlorine treatment of the drinking water. (See also XXI, *Civil Engineering.*)

Water Waste.—There has been a large extension during the year of the practice of periodic inspection by municipal authorities to prevent water waste and also an increasing movement to provide for the complete metering of the supply. In New York a bill was passed giving the Commissioner of Water Supply, Gas and Electricity of New York City authority to place water meters in all houses occupied by more than one family (Laws of 1916, Ch. 602). The advantage of inspection is strikingly illustrated by the experience of Cambridge, Mass. The report of the water department shows that the establishment of a monthly inspection of all service pipes has cut the daily consumption 1,508,774 gals. The city is about one-third metered. The report predicts a possible further saving, through the extension of the meter system and more rigid inspection, of 500,000 gals. per day.

Municipal Waterworks.—There is an ever-increasing tendency on the part of American communities to municipalize their waterworks. The U. S. Bureau of the Census report for the year ending June 30, 1915, states that of all cities of 30,000 population, 204 in number, only 46 have no municipal water-supply system. (See also *Municipal Ownership, supra;* VII, *Municipal Government;* and XXI, *Civil Engineering.*)

Altoona, Wis.—Altoona, Wis., is apparently possessed of a sense of humor as well as a belief in municipal ownership. The four privately operated saloons were driven out of business and on July 1 a municipal saloon was started with the proviso that its profits were to be used for the acquisition of municipal water works.

Louisville.—The city of Louisville, Ky., completed an elaborate filtration plant in 1909. During 1916 it opened an important supplementary filter at Silver Hills, New Albany.

New York City.—Perhaps the most interesting event of the year in connection with municipal water-supply systems was the fight which was waged by New York City to prevent the threatened pollution of its Ashokan watershed through the construction of the Mohansic State Hospital for the Insane and the New York Training School for Boys at Yorktown Heights within the watershed area. It was contended by the state authorities that the sewage-purification systems which it was planned to install in these institutions would make the effluent entirely sterile and that there could be no reasonable objection to its discharge into the city's water supply. Mayor Mitchel personally appealed to the Governor to prevent the carrying out of the plans and the Merchants' Association of New York carried on a vigorous campaign to secure legislation safeguarding the city's interests. It was not possible to reach a satisfactory final settlement of the matter owing to the adjournment of the legislature and it is expected that the contest will be renewed with the reconvening of the legislature in 1917.

New York City has also been compelled to fight the various cities and towns of Westchester County which have sought legislation to give them permission to tap the city's new water-supply system. A statute was finally passed providing that any municipal corporation in Westchester County which desired to receive water might apply to the commissioner of the Department of Water Supply, Gas and Electricity in the City of New York whereupon it should "be the duty of said officer to grant a permit or authorization for the said connections under reasonable rules and regulations." It also provided that no greater quantity should be taken by said municipal corporation than the proportionate amount used by the City of New York, the proportion being calculated in accordance with the number of inhabitants. This bill was vetoed by Mayor Mitchel but was repassed by the legislature over his objection (Laws of 1916, Ch. 601), being the first bill passed over the veto of the mayor of the City of New York for over 17 years.

There has been a continuing fight on the part of New York City to prevent excessive taxation of water-supply properties by the various communities in which they are located. The city of Yonkers, for example, assessed New York City water-supply property within its corporate limits at $23,070,950. This figure was subsequently reduced by the courts to $1,496,306.

Oakland.—During the year the city of Oakland, Cal., lost its ten-years fight through the courts against the Contra Costa Water Co. to enforce the terms of a city ordinance passed in 1904 reducing water rates.

Philadelphia.—Philadelphia's available daily water supply is about 300,000,000 gals. Chief Davis of the Water Department reported during the year the urgent necessity of increasing this by at least one-third. He estimated the cost at approximately $5,000,000.

New Jersey.—The control of the development of sources of municipal water supply in New Jersey has been changed radically during the year. The State Water Supply Commission has been abolished. Two new boards, the North and South Jersey Water Supply Commissions, have been created in place of the former board to handle specific problems connected with the Wanaque and Wharton projects. The general work of the former Commission has been transferred to the Department of Conservation and Development as part of the work of the Geological Survey. The North Jersey Commission, which is the more important of the new boards, is made up of G. F. Wright of Paterson, E. C. Houck of Montclair, Dr. W. E. Ramsay of Perth Amboy and L. J. Fonnele of Bayonne, appointed for one, two, three and four years respectively. Dr. Ramsay and Mr. Fonnele were members of the former State Commission. The work of the new board will consist largely in an effort to persuade the larger cities and towns of northern New Jersey to unite in a water-supply project.

SEWAGE AND REFUSE DISPOSAL

New York City.—The chief interest in connection with municipal sewerage systems continues to be the attempts which the larger communities are making to take care of final disposition in such a way as not to pollute unduly the waterways of the country. As noted in a number of previous issues of the YEAR BOOK (1913, p. 305; 1914, p. 299; 1915, p. 307), the problem is peculiarly acute in the city of New York, which has polluted its harbor almost to the point of saturation. The plans prepared by the Metropolitan Sewerage Commission after some seven years of study (*A. Y. B.*, 1914, p. 299) call for such a vast expenditure of money that the city can hardly look forward to carrying them out until it recovers from the immense expenditures which it is making for rapid-transit purposes. In the meantime the city authorities are working actively to reduce pollution as far as possible by less expensive processes. It is planned to utilize at a number of points comparatively small screening chambers placed under city streets as near as possible to important sewer outlets.

These screening chambers are so designed that the sewage passes through revolving screens which will remove the major portion of the solids. The effluent passes into the harbor and the sludge is to be removed periodically as it accumulates. The first of these chambers is now under construction in the Borough of Manhattan at the foot of Dyckman Street. The city is continuing its protests against the further pollution of New York Harbor by the Passaic Trunk Line Sewer and by the Bronx Valley Sewer (*A. Y. B.*, 1912, p. 289; 1913, p. 306; 1915, p. 307). In both of these matters it is expected that ultimately the city will secure Federal insistence upon the erection of purification plants at the outfalls.

New York City has also been confronted during the year with the necessity of rearranging plans for the disposal of city garbage, its contract for disposal at the Jamaica Bay plant having expired. After fruitless attempts to secure legislation which would permit it to construct a municipal plant, a contract was finally made for the erection of a private plant in the Borough of Richmond. The proposition to center final disposal in this borough raised a storm of protest which for a time assumed the proportions of a miniature civil war. The matter was contested as far as possible through the courts, and it was even necessary to maintain a police guard at the proposed site to enable the contractors to prosecute their work. An appeal was finally made to Congress to prohibit the passage of garbage-laden scows through the narrow waters of Arthur Kill and Kill van Kull, on the ground that Federal money had been expended on the improvement of these streams, and that a nuisance would be created by the handling of garbage which would make the investment of the Federal Government of greatly reduced value. Proposals to build an artificial island in the Lower Bay as a substitute site were considered by the city but rejected because of the prohibitive expense. At the close of the year it appeared that in spite of all obstacles the plant would be finally constructed and placed in operation.

Bridgeport.—Bridgeport, Conn., is one of the cities which has felt the boom influence of the manufacture of munitions for the European War. The sudden expansion in factory population necessitated new sewer construction during the year involving the expenditure of over $500,000. Over 9,000 ft. of new mains were laid.

Kansas City, Mo.—The health board of Kansas City, Mo., has employed Rudolph Hering, a consulting sanitary engineer, to advise concerning methods of garbage and waste disposal. The city is prepared to spend $500,000 on a disposal plant.

Texas.—There has been considerable impetus to the construction of sewage-disposal plants in Texas during the year owing to the passage of the anti-stream pollution law at the last session of the legislature. This statute becomes effective on Jan. 1, 1917. In order to comply with its provisions the following Texan cities and towns began the construction of sewage-disposal plants during the year: Arlington, Celina, Gonzales, Jefferson, Lancaster, Lufkin, Melvin, Mineral Wells, Plainview, Porney, Seguin, Tyler, Wells Point and Whitewright.

Pollution of Boundary Waters Between United States and Canada.—As noted in the YEAR BOOK for 1913 (p. 306) the increasing pollution of the Niagara River and other boundary waters between the United States and Canada has been the subject of joint study and consideration by the two countries. During the summer the International Joint Waterways Commission held a series of hearings in various cities along the border. The Commission found a degree of pollution in many cases deemed dangerous to health. It recommended the purification of the sewage of Buffalo. A plant adequate for the purpose is estimated to cost not less than $3,000,000. Hearings held in Detroit resulted in a similar recommendation for that city. As a result of studies made by Clarence Hubke, a sewage expert for the city, the commissioner of public works recommended the construction of a purification plant combining sedimentation and disinfection. The estimated cost is $6,091,000, with an annual operating cost of $517,430, or about 54½ cents *per capita*.

XII. MILITARY AND NAVAL

THE ARMY

ROBERT B. MCBRIDE

MILITARY LEGISLATION

The National Defense Act.—The year 1916 has been marked by the volume and importance of military legislation in the United States to a degree greater than ever before in time of peace, and, measured by appropriations, greater than ever in our history. The Hay bill, entitled "An Act for making further and more effectual provision for the National Defense, and for other purposes," was finally passed by both houses of Congress, and approved by the President on June 3 (see also I, *The Sixty-Fourth Congress*). The enacting clause provided that

> the Army of the United States shall consist of the Regular Army, the Volunteer Army, the Officers Reserve Corps, the Enlisted Reserve Corps, the National Guard while in the service of the United States, and such other land forces as are now, or may hereafter be, authorized by law.

Authorized Strength.—The organization of the line of the Regular Army was fixed by the Act, including the existing organizations, at 64 regiments of infantry, 25 regiments of cavalry, 21 regiments of field artillery, a Coast Artillery Corps of practically 30,000 officers and men, and an Engineer Corps of seven regiments and two mounted battalions. The infantry will therefore be increased by 34 regiments, the cavalry by 10, the field artillery by 18, and the coast artillery by the equivalent of practically 9. The Engineers' Corps will be increased by about 6⅔ regiments. The total enlisted force of the Regular Army, excluding the Philippine Scouts, the enlisted men of the Quartermaster Corps, the Signal Corps and the Medical Department, and unassigned recruits, was limited to 175,000 men, except in time of emergency when public safety demanded a larger number or in time of actual or threatened war. In addition to the organizations mentioned, provision was made for a General Staff Corps, an Adjutant-General's Department, a Judge Advocate General's Department, a Quartermaster Corps, a Medical Department, an Ordnance Department, a Signal Corps, the Bureau of Insular Affairs, detached officers and non-commissioned officers, brigade, division and Army headquarters, chaplains, the Corps of Cadets, and the Regular Army Reserve, besides the recruiting parties and recruits, and various detachments for the service schools, the disciplinary guards and organizations, and the Indian Scouts. The increases in the commissioned and enlisted personnel were directed to be made in five annual increments. However, under the authority of the President, the entire increase could be ordered should he believe the public interest to demand such action.

Organization of the Line.—Section 3 of the Act directed the organization of the infantry, cavalry and field artillery into brigades and divisions, and prescribed that the typical brigade shall consist of a headquarters and three regiments of the troops of the special arm. The typical infantry division will be a headquarters, three infantry brigades, one cavalry regiment, a field-artillery brigade, one regiment of engineers, one field signal battalion, one aero squadron, one ammunition train, one supply train, one engineer train, and a sanitary train. The typical cavalry division will include a headquarters, three cavalry brigades, one regiment of field (horse) artillery, one battalion of mounted engineers, one mounted field signal battalion, one aero squadron, and the trains stated for an infantry division (*supra*).

Officers.—The number of major-generals will be increased by four, and of brigadier-generals by 18, and it was provided that major-generals should be appointed from the grade of brigadier-general, and brigadier-generals from the grade of colonel. Examinations for promotion, heretofore ended upon promotion to field rank, were extended to cover all promotions below brigadier-general.

The Act defined fully the powers and duties of the General Staff, specified the number and rank of officers to be in the General Staff, prescribed the methods by which they should be chosen, again made the term of office four years, and again directed that after serving such term, no officer could be redetailed until after two full years of service with troops.

The proportion of medical officers was prescribed not to exceed seven for every 1,000 enlisted men. Dental surgeons were authorized in the proportion of one to every 1,000 enlisted men. Provision was made whereby dental surgeons will be eligible for promotion, so as to have the rank, pay and allowances of captains and majors, but the total number of dental surgeons with rank of major shall never exceed 15 at one time.

Enlistments and Recruiting.—Enlistments in the Regular Army, according to the terms of the Act, will be hereafter for the period of seven years, the first three years with the colors, and the remaining period with the Reserve. Men may reënlist at the end of the three years for another term of seven. After the expiration of one year's honorable service, a man reported proficient by his battery, troop or company commander, may be furloughed if so directed by the Secretary of War to the Reserve. Persons under 18 years of age will not be enlisted without the consent of their parents or guardians. As an aid to recruiting, the President was authorized to utilize the services of second-, third-, and fourth-class postmasters, who will receive $5 for each accepted recruit procured by them.

The Regular Army Reserve.—The Regular Army Reserve will be composed of all men now in the reserve, or who shall hereafter become members of the reserve by furlough or enlistment under the Act of June 3 or under laws previously passed. Any honorably discharged soldier, with character at least good, can enlist in the Reserve provided he is not over 40 and is physically sound.

The President may assign reservists to any particular organization of the Regular Army, or he may organize the Reserve into units or detachments of any army or corps, with their own officers, either from the regular forces or from the Officers Reserve. He may summons reservists for 15 days' field training each year, for which service they will receive traveling expenses and the pay of their grade in the Regular Army. The Reserve may be mobilized in the event of actual or threatened hostilities and kept in active service as long as the President may deem necessary, but all enlistments, both in the Regular Army and in the Reserve, at the outbreak of a war shall continue in force for a year, unless terminated sooner by the order of the Secretary of War. Enlisted men of the reserve will be paid semi-annually at the rate of $24 per year. In time of war, a reservist, upon reporting for duty and being found fit for service, is entitled, in addition to the pay and allowances of his grade in the Regular Army, to a bonus of $3 per month for each month during which he has been a member of the Reserve, and also to his traveling and subsistence expenses from his home to the place of reporting. Service in the Reserve does not carry a right to retirement or retired pay, nor to a pension, except through disability incurred in the active service of the United States.

The Officers Reserve Corps.—Upon passing prescribed moral, mental and physical examinations, citizens may become members of the Officers Reserve Corps of the Regular Army, in all grades up to and including that of major, by Presidential appointment. No grade shall have a greater number of officers than the corresponding grade in the Regular Army, except that the number commissioned in the lowest grade shall not be limited. Hereafter no person over 32 years of age may be appointed a second lieutenant in the Reserve Corps, a first lieutenant after the age of 36,

a captain after the age of 40, or a major after the age of 45. The rule as to age limits does not apply to the various staff departments. Officers will receive the pay and allowances of their grades while actually on duty in the service of the United States. The old Medical Reserve Corps will cease to exist a year after the passage of the Act, and be merged into the Officers Reserve Corps.

The Act provided for a Reserve Officers Training Corps, to be established at colleges, universities and schools, and the Secretary of War was authorized to prescribe courses of instruction and training for the different units of such Corps. A minimum time of three hours per week for instruction and training was fixed, and the President was authorized to detail not exceeding 300 active officers of the Army and such retired officers as may be necessary and desire to serve at the educational institutions where one or more units of the Reserve Officers Corps will be maintained. Necessary numbers of enlisted men also will be detailed to these institutions to assist the officers, and the Secretary of War may furnish such equipment as may be necessary for the maintenance of the units of the Corps. Appointment from the training corps to the Officers Reserve Corps will be made by the President alone; appointees must agree to serve for 10 years. The total number of Reserve officers is limited to 50,000.

Schools and colleges other than those maintaining units of the Reserve Officers Training Corps will be supplied with such arms and equipment as may be necessary, and Regular Army officers and non-commissioned officers detailed as instructors, provided they have 100 or more students pursuing the military course. Citizens' training camps are specially authorized by the Act.

Temporary Additional Second Lieutenants in the Regular Army.—The President was empowered to appoint any reserve officer as an additional temporary second lieutenant of the Regular Army, in time of peace, for the purpose of instruction, for not exceeding six months, with the allowances of that grade but with pay of $100 per month. Under Section 51 of the Act, this power and the authority to appoint Reserve officers were extended to include graduates of schools who had completed the military course under a detailed officer of the Army but who graduated before the passage of the Act, provided they were between the ages of 21 and 25 years and had satisfactorily completed such additional practical training as may have been prescribed by the Secretary of War.

Enlisted Reserve Corps.—The Enlisted Reserve Corps must not be confused with either the Regular Army Reserve, or the National Guard Reserve. It is intended to supply enlisted reserve men for the Engineer, Signal, and Quartermaster Corps, and the ordnance and medical departments of the Regular Army. Any citizen of the United States or a person who has declared his intention to become a citizen, subject to moral, mental and physical examinations, may become a member of this Corps. Its members will have all the privileges and duties of men in like grades of the Regular Army when called into the active service of the United States. They may be ordered to active service for not over 15 days in any one calendar year, and in time of war may be ordered to duty.

Militia.—The Act defines the militia as all able-bodied male citizens and other able-bodied males who have declared their intention of becoming citizens, and who are between 18 and 45 years of age. It specifies that it shall be divided into the National Guard, the Naval Militia and the unorganized militia. Certain exemptions from combatant militia service are prescribed, but no person will be exempted from service declared to be non-combatant by the President.

The National Guard.—The land forces of the organized militia will be organized, armed and equipped as prescribed for the Regular Army, and the President is empowered to fix the particular units to be maintained in any state, territory or district. The states are forbidden to maintain other military organizations, except police and constabulary. Within one year of the passage of the Act, the number of the National Guard in each

state shall be 200 for each of its Representatives and Senators. Each succeeding year this number is to be increased by 50 per cent., until there is a total peace strength of 800 men for each Senator and Representative. Certain special provisions defining the rights of states with only one Representative were made. The President was empowered to assign organizations to the larger units, such as brigades and divisions, and to appoint officers of the Regular Army chiefs of staff, and assistant chiefs of staff to any National Guard division in the service of the United States. Rules were laid down for the proper care of Government property, the making of returns, the pay and supply of the National Guard, and for its proper training.

The President, by Section 118 of the Act, was empowered to make all rules and regulations necessary for the thorough organization, discipline, supply, and training of the militia.

A National Guard Reserve was provided for, and rules laid down for its organization and maintenance. The name of Militia Bureau was given to the existing Militia Division of the War Department, and it was provided that its chief should be, *ex officio*, a member of the General Staff.

Very detailed and minute directions were given in the Act, covering the supplies, training, maneuvers, encampments, discipline, and other matters relating to the Guard. Education at the service schools was prescribed for National Guard officers and men, who are to receive during their attendance at the schools, or at training camps or maneuvers, and while *en route* to and from them, the same pay and allowances as the officers and men of the Regular Army.

Qualifications for National Guard Officers.—Hereafter no person can be appointed an officer in the National Guard until he shall have passed such tests for physical, moral, and professional ability as the President may decide upon, before a board of Regular Army or National Guard officers. Commissions may be vacated by resignation, absence without leave for three months, by reason of the recommendations of efficiency boards or of the sentence of a court martial.

Appropriations for the National Guard.—The Act appropriated funds for the support of the National Guard, to include all arms, equipments, supplies, pay, and other expenses now authorized or which may hereafter be authorized by law (see *infra*). Some of the money is to be paid directly to the state authorities, who will disburse most of it, although some will be disbursed by the War Department. No organization of the National Guard can be disbanded without the consent of the President. Enlistment periods will be for six years, the first three with the colors and the last three with the National Guard Reserve. The Act makes it necessary for enlisted men to take the Federal oath before being recognized as guardsmen. Practically the same provision, by Section 73 of the Act, was made to apply to officers.

Pay for the National Guard.—All enlisted men of the Guard who shall attend not less than 48 drills per year will be paid, semi-annually, 25 per cent. of the amount paid as initial pay to men of like grade in the Regular Army; if they do not attend 48 drills, they are to be paid proportionately. The Act provides that at least 24 drills must be attended to entitle a man to pay for the semi-annual period; but a less number can be combined with the number attended during the next semi-annual period to compute annual pay. This means that a private of the National Guard attending four drills per month will receive about $3.75 per month. When ordered to training camps, maneuvers, schools, or active service, he will receive the same pay as the Regular Army enlisted man of like grade. All officers above the grade of first lieutenant will be paid $500 per year, except when entitled by the Act to the pay of Regular Army officers; first lieutenants will receive $240 per year, and second lieutenants $200.

Procurement of Military Supplies in Actual or Imminent War.—The President was empowered by the Act to purchase from any firm, corporation, individual or association, any military supplies made or sold by such firms, etc., and his orders will take precedence over any other orders received by such firm or corporation,

etc. In case of refusal the President, through the head of any department of the Government, can take immediate possession of the plant or business, and operate it by the Ordnance Department of the Army, for the benefit of the Government. A penalty, namely, imprisonment for not more than three years and a fine not to exceed $50,000, is provided for the responsible head of a concern who may be convicted of a refusal to obey the provisions of the Act.

Board on Mobilization of Industries Essential for Military Preparedness.—In order to have full information always at hand, a list of all privately owned plants in the United States equipped to manufacture arms or ammunition, and a list of such plants in other lines of work which may be readily transformed into such arm and ammunition factories, with complete details regarding them, will be compiled and kept by the Secretary of War. He is directed to prepare all necessary plans to effect such changes; and to assist him in such work, the President was empowered to appoint a Board on Mobilization of Industries Essential for Military Preparedness.

Nitrate Supply.—By Section 124 of the Act, the sum of $20,000,000 was appropriated for the purpose of providing Government nitrate factories, and the same section gave the President authority for all the investigation, purchase or reserve of lands containing nitrate deposits, building of plants, and operation of them which might be necessary.

Protection of the Uniform.—The Act made it unlawful for any person not an officer or enlisted man of the Army, Navy or Marine Corps, to wear the uniform of any of these services, or to wear any distinctive part of the uniform, or to wear a uniform any part of which is similar to such uniforms. Imprisonment not exceeding six months, and a fine not exceeding $300, either or both, will be the penalty for convicted violators of this section. The militia, the Boy Scouts, former officers whose service was terminated honorably, actors, students and instructors in military schools and colleges, were specifically authorized to wear uniforms prescribed by the proper authorities, provided such uniforms have marks or insignia to distinguish them from the uniforms of the Army and Navy, and, except in the case of the National Guard, no insignia of rank similar to that of the Regular forces.

Organization under the Act.—At the time of writing, the organization of the Army in accordance with the Act of June 3 has been in progress for about seven months. The table on the following page shows such organization as authorized for the current year; another increment will be due on July 1, 1917.

The following table shows the authorized and the actual strength on June 30, 1916, and June 30, 1915, with the increases during the year and the vacancies on those dates; it includes the Medical Department and Quartermaster Corps:

	Regular Army			Philippine Scouts			Total		
	Officers	Enlisted men	Total	Officers	Enlisted men	Total	Officers	Enlisted men	Total
Authorized strength:									
June 30, 1916	5,018	122,693	127,711	182	5,733	5,915	5,200	128,426	133,626
June 30, 1915	4,834	97,248	102,082	182	5,733	5,915	5,016	102,981	107,997
Increase during year.	184	25,445	25,629	.....	.....	.....	184	25,445	25,629
Actual strength:									
June 30, 1916	4,843	97,013	101,856	182	5,603	5,785	5,025	102,616	107,641
June 30, 1915	4,616	95,765	100,381	182	5,430	5,612	4,798	101,195	105,993
Increase during year.	227	1,248	1,475	.....	173	173	227	1,421	1,648
Vacancies:									
June 30, 1916	175	25,680	25,855	.....	130	130	175	25,810	25,985
June 30, 1915	218	1,483	1,701	.....	303	303	218	1,786	2,004

In the orders prescribing organization of troops under the new law, the old nomenclature was very generally observed, except in the Coast

AUTHORIZED STRENGTH OF THE ARMY

	Major-Generals	Brigadier-Generals	Colonels	Lieutenant-Colonels	Majors	Captains	First Lieutenants	Second Lieutenants	Chaplains	Total Commissioned Officers	Enlisted Men
General officers	7	21	....	....	....	.....	.....	.....	....	28	.....
General Staff Corps	....	....	9	7	16	6	.....	.....	....	38	.....
Adjutant-General's Department	....	1	8	11	8	.....	.....	.....	....	28	.....
Inspector-General's Department	....	1	7	4	7	.....	.....	.....	....	19	.....
Judge-Advocate General's Department	....	1	2	4	10	.....	.....	.....	....	17	.....
Quartermaster Corps	1	2	15	27	54	111	1	72	....	283	8,000
Medical Department	1	....	21	36	158	180	a753	76	....	a1,225	(b)
Corps of Engineers	....	1	17	24	55	78	74	50	3	302	2,198
Ordnance Department	....	1	7	10	22	28	28	.....	....	96	1,241
Signal Corps	....	1	2	3	8	32	93	.....	....	139	3,369
Bureau of Insular Affairs	....	1	1	....	1	.....	.....	.....	....	3	.....
Seventeen regiments of cavalry	....	....	17	17	51	255	260	260	17	877	17,357
Nine regiments of field artillery	....	....	9	9	19	100	121	114	9	381	7,881
Coast Artillery Corps	1	....	16	16	48	240	240	240	18	819	21,423
Thirty-seven regiments of infantry	....	....	37	37	110	552	565	552	37	1,890	49,876
Porto Rico Regiment of Infantry	....	....	....	1	3	15	16	15	1	51	1,348
Military Academy	....	....	5	2	....	.....	.....	.....	....	7	684
Detached officers	....	....	30	30	86	435	441	.....	....	1,022	.....
Additional officers	....	....	44	2	....	4	.....	.....	....	50	.....
Recruiting parties, recruit depots, and unassigned recruits	....	....	....	....	....	.....	.....	.....	....	.....	11,539
Service-school detachments	....	....	....	....	....	.....	.....	.....	....	.....	754
United States Disciplinary Barracks guards	....	....	....	....	....	.....	.....	.....	....	.....	468
With disciplinary organizations	....	....	....	....	....	.....	.....	.....	....	.....	101
Mounted orderlies	....	....	....	....	....	.....	.....	.....	....	.....	29
Sergeants for duty with the National Guard	....	....	....	....	....	.....	.....	.....	....	.....	209
Indian scouts	....	....	....	....	....	.....	.....	.....	....	.....	75
Total Regular Army	10	30	247	240	656	2,036	2,592	1,379	85	7,275	126,552
Additional force: Philippine Scouts	....	....	....	....	....	52	65	65	....	182	5,733
Grand total	10	30	247	240	656	2,088	2,657	1,444	85	7,457	132,285

a Includes 380 first lieutenants of the Medical Reserve Corps and 103 dental surgeons.
b Under the act of Congress approved March 1, 1887 (24 Stat. L., 435), the enlisted men of the Medical Department are not to be counted as part of the strength of the Army. The authorized strength is 6,614 enlisted men.

Artillery Corps. At the time the new law became effective, this Corps was composed of officers, non-commissioned staff officers, enlisted specialists, and 170 companies of coast artillery of practically 104 men each. Instead of giving new companies numbers from 171 up, the entire system was changed, and companies are now numbered at each fort, from one up to whatever number will cover the organizations stationed at such fort. Thus it is necessary to add the name of the fort to distinguish the particular organization.

ADMINISTRATION

War Department.—Lindley M. Garrison resigned as Secretary of War on Feb. 10 (see I, *The Administration*). Maj.-Gen. Hugh L. Scott, Chief of Staff, was secretary until March 9, when Hon. Newton B. Baker, of Ohio, became secretary. There has been no change in the general officers of the General Staff Corps, except that Brig.-Gen. Erasmus M. Weaver, Chief of Coast Artillery, was made major-general on July 6. Among the general officers of the Army, Brig.-

Gen. John J. Pershing was promoted to major-general on Sept. 25.

In the departments and bureau of the War Department, Brig.-Gen. Henry G. Sharpe succeeded Major-Gen. James B. Aleshire (retired on account of ill health) as Quartermaster General, and was promoted to be major-general on Sept. 21. Col. Abiel L. Smith was made a brigadier-general and assistant to the Quartermaster-General on the same date.

The vacancy caused by the death of Gen. Dan. C. Kingman, Chief of Engineers, was filled on March 7 by the promotion of Col. William M. Black to be Chief of Engineers and brigadier-general. Major-Gen. Albert L. Mills, Chief of the Militia Bureau, died very suddenly on Sept. 18, and Col. G. W. McIver was appointed Acting Chief of that Bureau, until the appointment of Brig.-Gen. William A. Mann on Oct. 26.

Distribution of Combatant Troops.—In the Eastern Department Brig.-Gen. Clarence P. Townsley succeeded Col. Stephen M. Foote as commander of the South Atlantic Coast Artillery District. There has been some increase in the number of troops in this Department, principally in the coast artillery and engineers, under the Act of June 3.

Major-Gen. Thomas H. Barry was transferred from the Philippine Department on April 1, 1916, to the command of the Central Department; Major-Gen. J. Franklin Bell succeeded Major-Gen. William H. Carter, in command of the Western Department; and Brig.-Gen. Hunter Liggett has commanded the Philippine Department since April 2, 1916. Brig.-Gen. Robert K. Evans succeeded Brig.-Gen. John P. Wisser in command of the Hawaiian Department, and was in turn succeeded by Brig.-Gen. F. S. Strong.

There have been various movements of troops during the year, but, as a whole, the cavalry, infantry and field artillery have nearly all been doing Mexican border duty. At the end of October the First Brigade, Brig.-Gen. Henry A. Green, Second Brigade, Brig.-Gen. William A. Mann, Fifth Brigade, Brig.-Gen. Geo. Bell, Jr., Sixth Brigade, Brig.-Gen. Thomas F. Davis, Seventh Brigade, Brig.-Gen. Charles G. Morton, Eighth Brigade, Major-Gen. John J. Pershing, the First Cavalry Brigade, Brig.-Gen. James Parker, and the Second Cavalry Brigade, were all on duty in the Southern Department, principally as border guards. There were also three regiments and a battalion of field artillery, about two regiments of engineers, five signal companies, and seven field hospital and ambulance companies on similar duty in the Department, nearly all in Texas, Arizona and New Mexico. General Pershing, with about 10,000 troops of all arms, has been in Mexico since March 15 (see *infra*). About 6,000 coast artillery troops were sent to the border in the spring, but were brought back to their stations after a few months' service, as there were no troops to take their places at the coast forts. The following table shows the geographical distribution of troops on June 30:

	Officers	Enlisted Men	Total
In the United States [1]	3,622	67,416	71,038
In Alaska	23	769	792
In the Philippine Islands:			
Regular Army	480	11,404	11,884
Philippine Scouts	182	5,603	5,785
In China	41	1,233	1,274
In Porto Rico	35	679	714
In Hawaii	333	8,112	8,445
In the Isthmian Canal Zone	253	6,846	7,099
Troops en route and officers at foreign stations	56	554	610
Total	[2] 5,025	[3] 102,616	107,641

[1] Includes troops serving in Mexico, it being deemed inadvisable at this time to give the exact number of troops serving in that country.
[2] Includes 154 first lieutenants of the Medical Reserve Corps.
[3] Includes 4,670 enlisted men of the Medical Department.

Appropriations.—An Act to make appropriations for urgent deficiencies was approved on July 1, for the fiscal year 1916. The funds appropriated amounted to approximately $26,733,349, the largest items being for transportation, clothing, etc., made necessary by mobilization of troops on the border (see *infra*), concentration of militia, etc.; $1,648,000, of this amount was for pay of the militia up to June 30, 1916. The other appropriations for military purposes (not including any naval appropriations)

made for the fiscal year 1917, are stated below:

Support of the Army, including pay of National Guard	$232,586,080.10
Military Academy	1,225,043.57
Militia, National Guard and civilian training	33,215,450.00
Fortifications and arsenals	32,161,945.00
Military posts and miscellaneous	3,727,859.99
Total military establishment	$302,916,378.66

The sum of $2,000,000 appropriated for support of dependent families of the militia and of enlisted men of the Army while the militia is mobilized is not included, nor is the sum of $20,000,000 appropriated for nitrate manufacturing (see *supra*).

The Regular Service.—It has not been possible to decrease the number of Regular troops on Mexican-border duty during the year. Practically three-fourths of the cavalry, infantry and field artillery have been on duty in Texas, Arizona, New Mexico and Mexico during most of the year. Maneuvers and marches have been held, and such of the regulars as were available were used to a great extent in training the militia sent to that region. In other parts of the United States several citizens' training camps have been held.

Organization of Units Under the New Law.—Organization of units of infantry, field artillery and cavalry according to the Act of June 3 was begun about the first of July. General Orders No. 22, June 30, 1916, prescribed that generally new regiments were to be organized by taking proportionate numbers of each grade from the old regiments, so that none would be composed entirely of new recruits. All the organizations are being completed as fast as possible by recruiting, although there is great difficulty in securing recruits for the Regular Army. The order mentioned directed the organization of four new regiments of infantry in the United States, one in the Philippine Islands, one in Hawaii, and one in the Canal Zone; two new cavalry regiments, to be organized in the United States; and three new field artillery regiments, two light, to be organized in the United States, and one heavy, to be organized in Hawaii.

The order directed the organization of the existing engineer troops into three regiments, the first and second to be organized in the United States, and the third to have headquarters in Manila, with companies in the Philippines, Hawaii and the Canal Zone. The First Battalion of Mounted Engineers (one company only directed) was ordered to be organized in the United States. The engineer regiments were to consist of an enlisted strength of:

Regimental headquarters	36
Two battalions, each headquarters, and three companies	662
Total number of enlisted men in regiment	698
Mounted company	74
Band	30

The enlisted strength and organization of the regiments of the infantry, cavalry and field artillery were fixed by General Order No. 50, Sept. 23, 1916, as follows:

Infantry

One headquarters company	58
One machine-gun company	53
One supply company	37
Twelve companies, 100 men each in three battalions	1,200
Total number of enlisted men in regiment	1,348

Cavalry

One headquarters troop	54
One machine-gun troop	70
One supply troop	51
Twelve troops, 70 men each in three squadrons	840
Total number of enlisted men in regiment	1,015

Field Artillery

	Regiment of Two Battalions		Regiment of Three Battalions	
	Light	Mountain	Heavy	Horse
One headquarters company	76	79	88	88
One supply company	35	27	37	41
Two battalions of three batteries each	756	774		
or				
Three battalions of two batteries each			756	752
Total number of enlisted men in regiment	867	880	881	891

By General Order 50 the strength of the Coast Artillery Corps, including the first increment and exclusive of officers, was fixed at 510 enlisted specialists; Artillery non-commissioned officers and privates, 20,463; and Artillery bands, 450, a total of 21,423. The number of each grade from first sergeant to private, inclusive, for each coast defense was fixed by this order. General Order No. 31, July 24, 1916, gave coast-defense commanders authority to assign necessary personnel to each element of defense and to organize administrative and tactical units for each defense.

The total number of enlisted men in the line of the Army, including the five branches, was fixed at 99,981; Philippine Scouts, 5,733, in 13 battalions; Staff Corps, including Quartermaster Corps, Signal Corps, Ordnance and Medical Departments, 17,753; and miscellaneous organizations, including school detachments, disciplinary organizations, the recruiting service, etc., 13,747. Including the Medical Corps, the total enlisted strength of the Army, at the completion of the first increment, should be 137,214 men, approximately.

The Mobile Army.—As has been previously stated, the mobile army has been on the border, with the exception of a few organizations. A definite and well considered course of training has been laid out and followed so far as circumstances would permit. The basic course is laid down in General Order No. 17 of 1913, and instructions in that order have been amplified and explained in detail in General Order No. 36 of 1916. An intensive programme for 10 days' instruction is one of the most valuable features of the latter order, which is intended principally for the militia.

The Coast Artillery Corps.—Coast forts are still short of the required personnel, although the increase under the new law has relieved the most pressing needs in a few localities. Due to the reorganization, it was impossible for target practice to be held by all organizations, and some practices were held very late. From reports already in, accuracy in practice seems to be well up to the standard set several years ago. A gradual improvement is apparently taking place in long-range firing. More attention than heretofore was given to marches, maneuvers, and field training of every description. It has been recognized that the Artillery must be as well prepared to resist close attack by land forces from the rear and flank, as to perform their particular task of serving guns of position against naval forces. Vocational training has been very successful in the Coast Artillery. About 17 per cent. of the enlisted personnel have pursued the various courses. A clerical course was added to the enlisted men's division of the Coast Artillery School in January. During the year two officers of the Brazilian Navy, one of the Brazilian Artillery, and one of the Chilean Navy attended the officers' division.

The Quartermaster Corps.—A very large amount of work was thrown on the Quartermaster Corps by reason of the Mexican situation, the mobilization of the militia, and the requirements of the new law. Tests of various types of rolling kitchens have been made during the year, and it is thought that when tests have been completed, the American Army will have a most satisfactory apparatus. During the mobilization kitchen cars fully equipped, with 10 days' rations, were supplied to the militia. A plan for the coöperation of transportation companies and the Quartermaster Corps, and for coördination of the various activities involved in the transportation of troops and supplies was worked out by the Corps and the various transportation companies, and placed in successful operation during the large movements of troops and material occurring in 1916. Three hundred and fifty trains were required to transport the first 100,000 militia to the border; over 3,000 passenger cars, 400 baggage cars, 1,300 box cars, 2,000 stock cars, and 800 flat cars were used in the movement; approximately 4,900 engines with their crews were employed. All troop trains were given right of way, and in most cases made remarkably fast time. As an example, the 7th New York, 1,400 officers and men, with equipment, ammunition and baggage, left New York at 2 p. m. on June 27 and arrived at San Antonio, traveling 2,087 miles, at 8:30 p. m. on June 30th.

At the end of the fiscal year 1916, 10 motor-truck companies, each of 27 1½-ton trucks, six companies each of 28 3-ton trucks, and two companies each of 33 3-ton trucks, were in operation along the Mexican border or *en route* thereto. Twelve of these companies operated from Columbus, N. M., to the base in Mexico, a distance of 301 miles.

The Engineer Corps.—Practically all of the Engineers Corps has been on duty on the border. With the increase provided for in the new legislation, much needed troops will be secured for use in the field without entirely denuding the home stations of the Corps. Schools and other instruction have been carried out in the usual manner, and many engineer officers have been on duty on the various defense boards throughout the country. New fortifications on the western coast have been completed, and plans are on foot for the new fortifications at the mouth of Chesapeake Bay and in some other localities.

The Signal Corps.—Aviation has received more attention in 1916 than in any prior year. Scouting by means of aeroplanes was used by our Army for the first time in Mexico. Congress has made generous appropriations for this branch of the service, and much has been done to attract young officers and men to the work. Funds have been provided for the purchase of new machines and for the cost of training. The new organization plans provide seven aero squadrons for the Regular Army, 12 squadrons for the National Guard, and five for the coast defenses of both coasts, besides certain other units for the mobile army and the Coast Artillery. Orders have been placed (or proposals asked) for the machines listed below:

Reconnaissance biplanes	91
Advance training aeroplanes	120
Primary training aeroplanes	34
Pursuit aeroplanes	13
Reconnaissance hydro-aeroplanes	155
Land combat aeroplanes	6
Total	419

In addition, five captive balloons for field-artillery fire control have been ordered. Contracts have been made for many of these machines, and deliveries are being expedited.

Congress authorized an increase in the personnel of the Aviation Corps from 60 to 77 officers, and from 260 to 1,800 enlisted men. An aircraft radio set has been developed which will transmit messages 140 miles; in this field the Signal Corps holds the world's record, Capt. C. C. Culver in recent trials having sent messages 119 miles from aeroplanes in flight. Schools are conducted at Mineola, Long Island, N. Y., San Diego, Cal., and Chicago. A base for equipment of aero squadrons and for instruction in advanced military aviation has been established at San Antonio, Tex. A field officers training course has been instituted and several field officers detailed to pursue it. (See also XXI, *Aeronautics.*)

The Medical Corps.—Medical officers were required in large numbers on the border and with the militia during the year. As a consequence, many posts in the United States were left with insufficient numbers of such officers, and the work thrown on the officers and men has been arduous and trying. Nevertheless, the health of the Army has been very good, sanitation has been kept up, and preventive, rather than curative, measures have been found most effective. The admission rate for sickness was lower than it has been for the past 10 years. The non-effective rate for 1915 was 25.22 per 1,000; for 1906 it was 47.86 per 1,000. There were eight cases of typhoid fever, only four of them among troops serving in the United States, and no deaths from this disease. The admission rate for alcoholism was lower than it has ever been before; records show a steady diminution of alcoholism since 1907. Malarial fevers have decreased in number until the non-effective rate for 1915 was only 0.54, while in 1906 it was 2.55 per 1,000. Complete records for 1916 are not yet available.

A thoroughly equipped and efficient hospital train was constructed at the Pullman shops from plans made jointly by a medical officer of the Army and the Pullman supervising constructor. The capacity of this train, consisting of 10 modified standard Pullman cars, is 76 bed cases and 120 ambulance cases. It has already given very valuable service.

Judge Advocate General's Department.—The most important work done by the Judge Advocate General's Department during the year, so far as purely military affairs were concerned, was the long thought of and much needed revision of the Articles of War, made law by the Act of Congress approved Aug. 29, 1916. Many of the Articles were more than a century old, and the revision was necessary to coördinate the discipline and government of the United States Army with modern thought and with the many advances which have been made during the past hundred years. The Act of Aug. 29 further directed a much needed revision and codification of all the military laws of the country.

The Military Academy.—The first increment in the increase in number of cadets has resulted in a total number of about 769. Even this increase has crowded the barracks and the academic buildings to an extent necessitating immediate action, and a board of officers has been appointed to plan building additions to meet the needs. Practically all of the class of 1916 received promotion to the grade of first lieutenant on July 1, on account of the increase in the Army, leaving all places for second lieutenants vacant.

Officers Appointed from the Ranks and from Civil Life.—After all cadets had been commissioned, and all promotions made, there still remained vacancies in the grade of second lieutenant numbering about 1,500. Under the law these could be filled by appointment from the ranks of the Army and the National Guard, from among honor graduates of certain schools and colleges, or from civil life. About 900 applications were made and that number of men designated for examination; of these 447 passed the mental, moral and physical examination. Many vacancies still exist, and the War Department has announced another examination on Jan. 29, 1917. This is an opportunity that does not seem to be well understood. Except for the coast artillery or engineers, where a good technical education is practically essential to pass the mental examination, the examinations have been made such that an intelligent graduate of a first-class high-school should be able, with conscientious study, to pass them. The successful candidates receive commissions as second lieutenants, with pay of $1,700 per year, quarters, medical attendance, and fuel and light. They are on probation for two years, and if found not suited to the profession for any cause will be honorably discharged at the end of that time, provided, of course, that they are not separated from the service in some other manner during the two years. The two-year period is principally a period of training and instruction, and the great majority of these young officers will probably receive permanent commissions.

Recruiting for the Regular Army.—The quarterly reports of general recruiting stations show that during the fiscal year 1916 161,617 applications were made, 27,468 of these being accepted and enlisted. The total number of enlistments were only about 17.1 per cent. of the applicants; 14,987 were rejected because of minority; 2,728 were aliens, and 3,537 were illiterate; 2,196 either refused to be finally enlisted, or failed to report at depots. The rest of the rejections were caused by various physical, mental and moral defects.

Pensions.—The total amount of pensions disbursed during the fiscal year 1916, divided among the different classes of pensioners, was as follows:

Regular Army	$3,625,910.24
Civil War	150,431,753.49
War with Spain	3,800,225.71
War of 1812	18,848.00
War with Mexico	803,280.54
Indian Wars	475,071.94
Total	$159,155,089.92

This is $6,363,176 less than the amount paid out in 1915. At the end of that year the total payments on account of pensions since 1790 amounted to $4,895,475,637.08; the 1916 disbursements bring this sum to a total of $5,054,630,727.

The number of pensioners decreased 38,575, leaving a total number on the rolls on June 30, 1916, of 709,572. Of this number 296,089 were widows, 5,226 other dependents, 3,793 minors, 1,092 helpless children, 252 nurses,

and 403,120 invalids; 362,277 of the pensioners were Civil War soldiers, and 286,080 were Civil War widows; there were 115 surviving widows of the War of 1812, and 3,785 of the Mexican War, there being also 513 surviving soldiers of the Mexican War.

By an Act of April 27, 1916, a Medal of Honor pension roll was established, by which each person on the roll was to receive a pension of $10 per month for life. 121 certificates for this roll were received in the Pension office, and it is believed that the total cost will not exceed $24,000 per annum. No pensions have yet been paid on this account, as Congress authorized a committee to investigate the Medal of Honor roll, and that committee has not yet reported.

THE MEXICAN OPERATIONS[1]

The Columbus Raid.—The familiar unsettled conditions on the Mexican border, long marked by small raids into the United States by Mexican bandits, finally culminated on the night of March 8-9 in an attack in force on the town of Columbus, N. M., by a band of outlaws under Francisco Villa, estimated at from 500 to 1,000 men. Villa's band crossed the international boundary at a point about three miles west of the boundary-line gate, and in the darkest hours of the night attacked the camp of about 500 men of the 13th Cavalry, which composed the garrison. From information obtained later, his plan was to defeat and disperse the garrison, loot the town, and then retreat into Mexico. Some of his men got into the town, where several civilians were killed, but in the fight with the cavalry Villa was defeated and he and his band forced to flee across the border, pursued almost immediately by one troop of the 13th. Another troop, stationed at the line, struck his force on the flank, and these two joined, and chased the retreating Mexicans for 12 miles. The pursuit was then given up for the time being, because of shortage of ammunition and water and the exhaustion of men and horses. The loss to the American forces, during the fight at Columbus, was seven soldiers and eight civilians killed, and two officers, five soldiers and two civilians wounded. The Mexicans lost at the same time 67 killed, and seven wounded and captured; and in the subsequent running fight, between 70 and 100 of the bandits were killed. They abandoned much property and many animals along the line of flight and continued to retreat toward the southeast.

The Punitive Expedition.—The next day, March 10, orders were sent to General Funston, commanding the Southern Department, directing him to organize an adequate force under Brig.-Gen. John J. Pershing, to go across the border in pursuit of the bandits. General Funston promptly proceeded to carry out the orders, and on March 15 a column consisting of seven troops of the 13th Cavalry, the 6th and 16th Infantry, Battery C, 6th Field Artillery, and Ambulance Company No. 7, left Columbus, crossed the line, and advanced *via* Palomas, Ascension, and Corralitos, toward Casas Grandes. On the same night a second column, composed of the 7th Cavalry, ten troops of the 10th Cavalry, and Battery B, 6th Field Artillery, moved from Culbersons Ranch, over the Ojitas road, and reached Colonia Dublan, four miles north of Nuevas Casas Grandes, on the night of March 17. From this locality the troops rapidly advanced to the south, the bandits breaking up into small bands and scattering before the march. Flying columns were pushed forward in all directions. There were several minor skirmishes with Villistas in the Belloza Valley, near Parral, during which one soldier was killed and two wounded, and a detachment of General Pershing's command overhauled some bandits near Guerrero on March 29 and defeated them with an American loss of five wounded.

On April 1, the 10th Cavalry, under Col. W. C. Brown, after one of the most remarkable night rides in history, surprised the bandits at Aguascalientes, killing 30 of them.

On April 12 Major Frank Tompkins, with troops K and M of the 13th Cavalry, commanded by Col. W. C. Brown, reached the town of Parral.

[1] On this subject see also I, *The Administration;* III, *International Relations;* and IV, *Mexico.*

The command camped outside the town, and a detachment was sent in about 11 p. m. to purchase supplies. Major Tompkins was well received by the civil and military officials, the commander of the Mexican *de facto* Government troops, General Lozano, accompanying him on his return to camp. As the outskirts of the town were reached, however, groups of native soldiers and civilians attacked the troops with stones and firearms. Major Tompkins immediately took position for defensive action, but was outflanked by large numbers of Mexican troops and forced to retire. He continued his withdrawal until Santa Cruz, about eight miles from Parral, was reached. Near that place he received reinforcements and the Mexicans gave up their attacks. In this affair two American soldiers were killed, two officers and four soldiers wounded, and one soldier missing. Forty Mexican soldiers were killed and one Mexican civilian wounded. The number of Mexican wounded was not ascertained.

For some time after the Parral fight General Pershing's command remained in the neighborhood of Colonia Dublan and Namaquipa, constantly hunting the scattered bands of Villa's outlaws, dispersed among the difficult mountains in that part of Mexico. In April there were several skirmishes in the mountains, all with small bands; one near Cocomoracha, by scouts from Colonel Erwin's command, and one at Tomachic, where a column under Colonel Dodd defeated a Villista force, killing six of them, wounding four, and capturing 25 horses, with an American loss of two killed and three wounded. In June, 20 Apache scouts under Lieut. James A. Shannon, 11th Cavalry, met and defeated a band of Villistas near Vas Varas pass, killing one of them.

A conference was held between the Mexican Minister of War, General Obregon, and Gen. Scott, at El Paso, on April 29, in an effort to arrive at some mutually beneficial policy, but it was unsuccessful.

In May the attention of the country was drawn to a renewal of the border raids. On May 5 Mexican bandits, to the number of about 200 men, attacked Glenn Springs, Tex. An outpost of nine men of the 14th Cavalry, under Sergeant Smyth, was stationed there. The Mexicans delivered their attack about 11:30 p. m., and continued it until 2:30 in the morning. Three soldiers and one civilian were killed, and three soldiers were wounded. It is thought that two Mexicans were killed, and a number wounded, but they withdrew about 7:30 a. m. of the 6th, and went to Deemer's store, capturing Deemer. Troops A and B, 8th Cavalry, and Troops F, H, and the machine gun troop of the 14th Cavalry, under Col. Frederick W. Sibley, 14th Cavalry, were ordered to Marfa, Tex., to pursue and capture these bandits. The troops performed their mission, capturing a bandit, rescuing Deemer, and driving the band, with severe punishment, far to the south. During the remaining days in May detachments from General Pershing's command had several skirmishes.

The situation not improving on the border, the President on May 9 issued a call for the concentration of the militia of Arizona, New Mexico and Texas. Subsequent raids at San Ygnacio, Tex., on June 15, where four American soldiers were killed and five wounded, besides six of the attacking bandits, and a skirmish about 12 miles west of Brownsville, where two Mexicans were killed, proved the wisdom of this course. On June 18 the President directed a concentration of a large part of the militia from the other states (see *infra*).

The next affair of importance was known as the "Carrizal incident." Capt. Charles T. Boyd, commanding troops C and K of the 10th Cavalry, was marching toward Villa Ahumada on a scouting expedition. On the morning of June 21, 1916, his column arrived at Carrizal, on his direct route, and he requested the permission of General Gomez, commanding the Carranza garrison, to march through the town. General Gomez sent an officer with a denial of the request, but while this officer and the Americans were conferring, Mexican troops were observed moving toward the flank of the cavalry. Captain Boyd immediately got his command into a defensive position, when he was attacked by the Mexican troops.

The Americans were badly outnumbered, and those who could had to retreat, fighting. Captain Boyd himself, Lieut. Henry R. Adair, and seven soldiers were killed, Capt. Lewis S. Morey and nine soldiers wounded, and 23 enlisted men and one civilian interpreter captured by the Mexicans and sent to Chihuahua. These men were afterwards released, and returned to the United States, with all their equipment and property (see also III, *International Relations*). The Mexican commander, General Gomez, and 38 other Mexicans were killed in this fight.

At Cruces, Mexico, in June, a detachment of 11 men of the 17th Infantry, two engineer soldiers, and one quartermaster were attacked by about 35 mounted Mexicans. One soldier was killed and two wounded, but they defeated the Mexicans with heavy loss, among the killed being the leader of the band, Candelario Cervantes, said to have been the instigator of the Columbus attack, and his lieutenant. On July 31 bandits killed a U. S. customs inspector, and one soldier, and wounded another near Fort Hancock, Tex. Three of the bandits were killed, and three captured by the Mexican *de facto* Government troops. Troopers of the 6th Cavalry repulsed an attack on the Big Bend Mine, near Terlingua, Tex., on Aug. 28.

General Pershing's command has been strengthened from time to time and now consists of about 10,000 troops of all arms. They have been in Mexico since March 15, and during part of the time have been actively engaged in the pursuit and dispersion of bandits. The work has been most difficult, a long line of communication has had to be kept up, and some of the service has been in a waterless, rocky waste. However, for a great part of the time the expedition has been in camp near Colonia Dublan, whence pursuing columns and detachments have been sent out.

Mobilization of the National Guard.—It became very apparent during the early months of the year that the small Regular Army was too limited in numbers properly to patrol and protect the line of the Mexican border, extending in long stretches through wild and difficult country. All of the infantry, cavalry and field artillery that could possibly be spared was sent to the Southern Department, and many coast forts were denuded of their garrisons in order that some regiments of coast artillery also could be used. The President, therefore, under the authority vested in him by the Constitution and the laws, issued the call of May 9 and subsequently the call of June 18. These two orders called into the service of the United States the larger part of the National Guard of all the states and of the District of Columbia.

The first troops were mustered into the service of the United States under the Act of Congress approved Jan. 21, 1903, as amended by the Act of May 27, 1908. Between the first call and the second, the National Defense Act of June 3 became law. These conditions created much confusion, and much labor was necessary in order to coördinate various requirements of the law.

Shortly after the second call about three-fourths of those called out were sent to the border, and there assigned to stations by General Funston, commanding the Southern Department. The rest of those included in the call remained at their mobilization camps for various reasons, the principal ones being lack of the requisite legal number of men, lack of supplies, and slowness in preparation, due to the inexperience of officers. There were mustered into the service of the United States the following organizations:

108	Regiments of infantry
7	Separate battalions of infantry
4	Regiments of cavalry
13	Separate squadrons of cavalry
21	Separate troops of cavalry
10	Regiments of field artillery
10	Separate battalions of field artillery
15	Separate batteries of field artillery
4	Battalions of engineers
14	Separate companies of engineers
4	Battalions of signal troops
16	Separate companies of signal troops
1	Aero company of signal troops
25	Ambulance companies
38	Field hospitals
1	Division supply train (N. Y.)

The troops from New York and Pennsylvania constituted a fairly well organized division. The others were more or less imperfectly organized into eight divisions.

On Aug. 31, 1916, there were in the Federal service the National Guardsmen shown in the following table:

	In Southern Department	In Mobilization Camps	Total
Officers.....	5,446	1,557	7,003
Enlisted men.	105,080	28,176	133,256
Total.....	110,526	29,733	140,259

On July 31 returns showed that the organizations turned out were short of their peace strength over 4,000 men, and of their war strength, over 97,000. This has been improved somewhat, but the National Guard still remains very much short of its authorized peace and war strengths. It is estimated that about 10 per cent. failed to respond to the calls. Of those responding, about 29 per cent. had to be discharged for physical disabilities. Of the final number mustered in, approximately 57 per cent. were officers and men with more or less training in the National Guard; the remaining 43 per cent. were without former service or training.

In October those organizations of the Guard which had been left at the mobilization camps were ordered to the Southern Department, while an equal number of Guard organizations in that Department were returned to the mobilization camps where they were slowly mustered out. At the end of the year the number of National Guard troops on the border is approximately 110,000 officers and men.

THE NAVY

A Veteran Observer[1]

Navy Department.—The administration of the Navy Department has been continued during 1915 with very few changes (*A. Y. B.*, 1915, p. 316; also in this issue, v, *The National Administration*). Rear-Adm. Leigh C. Palmer succeeded Rear-Adm. Victor Blue as Chief of the Bureau of Navigation, and Civil Engineer Frederick R. Harris succeeded Civil Engineer H. R. Stanford as Chief of the Bureau of Yards and Docks. There were as usual several changes among the officers in charge of the subsidiary offices.

Naval War College.—The work of the Naval War College is expanding rapidly. It is now sending out correspondence courses to the officers who are unable to attend lectures. Hereafter the examinations for promotion will contain questions pertaining to War College work. Officers holding War College diplomas are gaining in prestige, and the day is not far distant when such a diploma will be required before any officer is detailed to an important command.

Appropriations for 1916-17.—The Naval Appropriation Act approved on Aug. 29 was the largest and most comprehensive bill ever passed by any Congress in the history of the United States (see also I, *The Sixty-Fourth Congress*). Its more important provisions are noted below under various heads. The Act carried a total appropriation of $313,300,555, as compared with $147,538,981 for the preceding year, and authorized a three years' building programme providing for the addition to the Navy of 156 vessels of all classes, at a total cost of $502,482,214. The table on the next page explains the programme.

Included in the above total, the Act appropriated $59,000,194 for hull and machinery of vessels building and heretofore authorized; $47,110,000 for armor and armament of vessels building and heretofore authorized; $5,282,593 for submarines heretofore authorized; and $19,485,500 for ammunition for vessels herein authorized.

The Chief of Naval Operations was granted the title of admiral, with rank next after the Admiral of the Navy (George Dewey), at a salary of $10,000 per annum. Not less than 15 officers of the grade of lieutenant commander and above shall be detailed to assist him. The investigation of the question of fuel-oil supplies is to be continued, and $60,000

[1] The regulations of the Navy Department prevent us from presenting our customary review of naval affairs over the signature of a naval officer. This article, which contains nothing confidential or controversial, is contributed by a competent authority, the greater part of its statements being drawn from official and published reports, the remainder from newspapers and other periodicals.

THE THREE-YEAR BUILDING PROGRAMME

Class	Number to be begun as soon as practicable and within six months	Number to be begun in 1917, 1918, and 1919	Total number to be contracted for prior to July 1, 1919	Remarks
Battleships	4	6	10	The first 4 are to cost $11,500,000 each, exclusive of armor and armament.
Battle cruisers	4	2	6	The first 4 are to cost $16,500,000 each, exclusive of armor and armament.
Scout cruisers	4	6	10	The first 4 are to cost $5,000,000 each, exclusive of armor and armament.
Destroyers	20	30	50	The first 20 are to cost $1,200,000 each, exclusive of armor and armament.
Fleet submarines	..	..	9	Merely authorizes 9 to be laid down prior to July 1 1919.
Coast submarines	3	..	..	800 tons each at $1,200,000 each, exclusive of armor and armament.
	27	28	58	First 27 to cost $700,000 each, exclusive of armor and armament.
	1	..	..	Neff type, experiment.
Fuel ships	1	2	3	First one to cost $1,500,000.
Repair ship	..	..	1	.....
Transport	..	..	1	.....
Hospital ship	1	..	1	To cost $2,350,000.
Destroyer tenders	..	..	2	.....
Fleet submarine tender	..	..	1	.....
Ammunition ships	1	1	2	The first to cost $2,350,000.
Gunboats	1	1	2	The first to cost $860,000.

was appropriated therefor. The Act authorized an expenditure of $1,411,222 for erecting a projectile plant, and an armor-plate plant was authorized at an expenditure of $11,000,000. Other appropriations comprised $13,720,000 for purchase of ammunition, $800,000 for torpedoes, $4,503,524 for reserve ordnance supplies, $1,000,000 for an experimental research laboratory, and $921,740 for reserve medical supplies. The President was authorized to appoint a board of five naval officers to report on the location of U. S. navy yards and bases (submarine and aero). Rear-Adm. J. M. Helm is President of this Board.

The Fleet.—During the year the fleet continued its usual training. Target practice, tactical and strategical maneuvers, war games, etc., were carried out as scheduled. There can be no doubt that the fleet is increasing in efficiency. On Aug. 29 the armored cruiser *Memphis* (formerly *Tennessee*) was driven ashore at Santo Domingo and is a total loss. As this class of vessel is practically obsolete the military loss is negligible.

On Sept. 1 the vessels of the Navy were grouped as follows:

ATLANTIC FLEET, Adm. Henry T. Mayo:

Battleship Force (Vice-Adm. Dewitt Coffman): 10 dreadnoughts and six pre-dreadnought battleships.
Cruiser Force (Rear Adm. C. F. Pond): one pre-dreadnought, two armored cruisers, two cruisers, five gunboats, and one transport.
Destroyer Force (Rear-Adm. Albert Gleaves): 47 destroyers, one cruiser, and three tenders.
Submarine Force (Rear-Adm. Albert W. Grant): 22 submarines, two cruisers, and seven tenders.
Mine Force (Comdr. R. R. Belknap): three mine planters, one ammunition ship, and four tugs.
Train (Capt. W. L. Rodgers): two repair ships, five fuel ships, two supply ships, and one hospital ship.
Reserve Force (Capt. John Hood): one dreadnought, 14 predreadnoughts, one armored cruiser, and two cruisers.

PACIFIC FLEET, Adm. William B. Caperton:

One armored cruiser, five cruisers, two gunboats, and one transport.
Coast Torpedo Force: nine coast torpedo boats, and one cruiser.
Submarine Force: 10 submarines, one cruiser, and three tenders.
Train: one supply ship, four fuel ships, and one tug.
Reserve Force (Rear-Adm. W. F. Fullam): five armored cruisers, three cruisers.

VESSELS UNDER CONSTRUCTION, SEPT. 1, 1916

	Tonnage	Power [1]	Per cent. Completed, Sept. 1
Battleships [2]			
Arizona	31,400	P. Turb. grd.	98.8
New Mexico	32,000	Electric	43.5
Mississippi	32,000	C. Turb. grd.	53.3
Idaho	32,000	P. " "	63.4
Tennessee	.....	Electric	....
California	.....	"	1.7
Destroyers [3]			
Davis	1,075	P. Turb. grd.	94.0
Allen	1,075	" "	88.5
Wilkes	1,110	" "	86.5
Shaw	1,110	" "	57.3
Caldwell	.....	C. Turb. grd.	11.3
Craven	.....	" "	7.5
Gwin	.....	P. Turb. grd.	9.8
Conner	.....	" "	9.7
Stockton	.....	" "	9.9
Manley	.....	" "	19.5
Submarines [4]			
G–2	.....	Diesel eng.	92.0
G–3	.....	" "	89.5
L–2	.....	" "	99.4
L–5	.....	" "	87.5
L–6	.....	" "	84.6
L–7	.....	" "	83.5
M–1	.....	" "	99.4
L–8	.....	" "	90.1
L–10	.....	" "	....
L–11	.....	" "	....
Schley	.....	" "	25.5
N–1	.....	" "	62.1
N–2	.....	" "	61.7
N–3	.....	" "	61.0
N–4	.....	" "	72.0
N–5	.....	" "	72.7
N–6	.....	" "	71.2
N–7	.....	" "	67.8
O–1	.....	" "	....
O–2	.....	" "	....
O–3	.....	" "	15.2
O–4	.....	" "	15.2
O–5	.....	" "	15.2
O–6	.....	" "	15.2
O–7	.....	" "	15.2
O–8	.....	" "	14.7
O–9	.....	" "	14.7
O–10	.....	" "	14.7
O–11	.....	" "	32.4
O–12	.....	" "	31.4
O–13	.....	" "	29.8
O–14	.....	" "	20.8
O–15	.....	" "	19.5
O–16	.....	" "	17.8
Fuel Ships [5]			
Maumee	14,500	Diesel eng.	99.7
Cuyama	.....	Recip. eng.	73.2
Supply Ship [5]			
Bridge	8,500	Recip. eng.	82.3
Transport [5]			
Henderson	10,000	Recip. eng.	72.4

[1] Parsons or Curtis steam turbines, geared or ungeared; electric drive; Diesel oil engines; or reciprocating steam engines. [2] Speed 21 knots. [3] Speed 29.5–32 knots. [4] Speed 13–14 knots, except the *Schley*, 20 knots. [5] Speed 14 knots.

Asiatic Fleet, Adm. Albert G. Winterhalter:

Three cruisers and nine gunboats.
Torpedo Force: five coast torpedo boats and one tender.
Submarine Force: nine submarines and one tender.
Auxiliaries: two fuel ships, one monitor, and two tugs.

Unassigned to Fleets:

One monitor, 10 torpedo boats, eight fuel ships, four gunboats, four yachts, four tugs, one submarine, two transports, two surveying ships, one tender, one supply-ship, and five cruisers.

New Construction.—The accompanying table gives the principal data of all the vessels under construction on Sept. 1, 1916. The specifications for new construction authorized by the Act of Aug. 29 for the year 1917 were sent out in September and October, and it was planned to commence work on most of these vessels before the end of the year. The exact characteristics of the new vessels are confidential, but the information in the table on the following page, given out by the Secretary of the Navy, is probably a close approximation.

Personnel.—The necessity for an increase in personnel, commissioned and enlisted, active and reserve, had become so urgent that Congress finally incorporated in the Act of Aug. 29 provisions to relieve the situation. The enlisted personnel was increased to 68,700, exclusive of Marine, hospital and flying corps. The President is authorized to increase this total whenever an emergency arises. The authorized strength of the commissioned line personnel was set at four per cent. of the authorized enlisted strength. The staff corps are based on the line. In addition, the number of midshipmen at the Naval Academy was increased so that now each Senator and each Representative may have three midshipmen at the Academy at the same time, while the President may appoint 15 and the Secretary of the Navy 25 Midshipmen yearly; also four Filipinos may attend the Academy yearly.

These increases were both necessary and desirable, but during the last few weeks of its session Congress undertook to pass some measures in regard to promotion which were passed hurriedly, could not have been considered

CHARACTERISTICS OF NEW VESSELS

Type	Number to be Built in 1917	Tonnage	Speed, Knots	Armor	Armament	Length	Beam	Draught	Complement
Battle cruisers.	4	35,000	32–35	About 8″ belt	10–14″ ? – 5″	850′	97′		
Battleships . . .	4	32,600	21	Heavy	8–16″ 18– 5″ 4–3″ a.a.	624′			1,022
Scout cruisers [1]	4	7,100	35	Light	8–6″ 4 t. t. 2–3″ a.a.	550′	55′		330
Destroyers	20	1,185	35	None	4–4″ 4 t. t. 2 a.a.				95
Fleet scouts [2] . .	?								
Coast-defense submarines [3]	31								
Fuel ships [4] . . .	1	14,500	14			455′	56′	26⅓′	
Hospital ships [5]	1	9,800	16			460′	61′	19½′	
Ammunition ships [6]	1								
Gunboat	1	1,575	12		3–4″ 2–1 pdr. 4 machine 2–3 pdr. 2–3″ field pieces	241⅙′	41¼′	11⅛′	149

[1] Will carry seaplanes. [2] No data. [3] One of Neff design, three of increased size, 27 of usual type. [4] Oil tankers, 9,600 tons capacity. [5] Will accommodate 500 patients. [6] Plans not completed.

sufficiently, and were not the result of mature deliberation. Among many complaints against these measures the greatest complaint is registered against promotion by selection. Some officers are wholly opposed to it, some are equally in favor, but the majority seem to think that if promotion by selection must come, the method of selection should be more carefully considered and decided upon only after a sufficient number of officers have been consulted. This, it is claimed, was not done.

The personnel sections of the Naval Appropriation Act were radical and sweeping. The more important provisions were the following:

(1) The Hospital Corps shall be 3.5 per cent. of the authorized strength of all other active naval forces.

(2) One dental surgeon is allowed per 1,000 men. They serve five years with rank of lieutenant (junior grade), 15 years with rank of lieutenant, and then with rank of lieutenant commander. Not more than ten shall have rank of lieutenant commander at same time.

(3) The total number of commissioned line officers is not to exceed 4 per cent. of the authorized enlisted strength, exclusive of hospital, marine and flying corps. These are to be in the proportion of one rear-admiral and four captains to 7 commanders, 14 lieutenant commanders, 32½ lieutenants, 41½ lieutenants (junior grade) and ensigns.

(4) The commissioned strength of the pay corps shall be 12 per cent., construction corps 5 per cent., and civil-engineer corps 2 per cent., of the commissioned strength of the line. The proportion of officers in each grade is limited to definite percentages.

(5) The corps of professors of mathematics is gradually to die out until all of the present members pass out of the corps.

(6) The commissioned strength of the Medical Corps is limited to 6.5 per cent. of the total strength of all branches of the active service. The proportion of officers in each grade is fixed by law.

(7) Chief warrant officers receive the pay and allowances of lieutenant (junior grade) after six years' service and of lieutenant after 12 years' service.

(8) Promotion in the line to commander, captain, and rear-admiral shall hereafter be by a board of nine rear-admirals, convened each December. Six members of the board must agree on each person selected. The selections are then submitted to the President for approval. Not more than 10 captains are to be appointed each year.

(9) After 1920 all officers must have two years' sea service in grade before becoming eligible for selection. All captains of 56, all commanders of 50, and all lieutenant commanders of 45 shall be retired. The retired pay shall be 2½ per cent. for each year of service, provided it does not exceed 75 per cent. of the active pay.

(10) The retiring age of all officers is raised from 62 to 64 years.

(11) To provide for a sufficient engineer's force, the Secretary of the Navy may nominate line officers of the grade

of lieutenant or above to perform engineering duty only as provided by the Act of March 3, 1899. In addition the Secretary may appoint annually for 10 years 30 acting ensigns for engineering duties. These, after two years at sea and one year at the Naval Academy, may become lieutenant (junior grade) and thereafter be regularly promoted in the case of the other engineer officers.

(12) Six classes of reserves are established: (1) Fleet Naval Reserve, (2) Naval Reserve, (3) Naval Auxiliary Reserve, (4) Naval Coast Defense Reserve, (5) Volunteer Naval Reserve, and (6) Naval Reserve Flying Corps. The men are to be drawn from ex-service men, the seafaring population, and such other civilians as may volunteer. Various rates of compensation and gratuities are offered, ranging from nothing to two months' base pay, depending upon the work to be done and the class to which the man belongs.

The Navy Department is bending every effort to recruit to the new full authorized strength in addition to making the reserve forces sufficiently attractive in order to enroll a large force of reserves. The European War has demonstrated the need for reserve personnel and it is estimated that the United States naval reserves should number at least one and one-half times the number of men actually on the active list. Until this is accomplished this Nation will *not be fully prepared.*

The Marine Corps.—The Marine Corps continues to keep up its excellent traditions. It is the one branch of the entire Navy that is properly coordinated, that is prepared in every sense of the word. Its work in Haiti and the Dominican Republic (see III, *International Relations;* and IV, *Latin America*) cannot be excelled. The rewards legislated by Congress were richly deserved. The Corps should be enlarged in proportion to the amount of work it is called on to perform instead of being restricted to a numerical strength equal to 20 per cent. of the line of the Navy. The effect of the Naval Appropriation Act may be summarized as follows:

(1) The total number of commissioned officers (line and staff) shall be four per cent. of the authorized enlisted strength. The officers shall be in the proportion of one officer senior to colonel, to four colonels, to five lieutenant-colonels, to 14 majors, to 37 captains, to 31 first lieutenants, to 31 second lieutenants.

(2) Four brigadier-generals are to be selected from the colonels of the line.

(3) The adjutant and inspector, the senior quartermaster and the senior paymaster were commissioned brigadier-generals.

(4) The staff shall not exceed eight per cent. of the line.

(5) Staff officers are given an opportunity of getting back into the line, and hereafter promotion will be by a "single" or common list for line and staff combined.

(6) The warrant grades of "marine gunner" and "quartermaster clerk" were created and appointments provided for each.

(7) Colonels of 45 years' service or after 40 years' service when reaching the age of 64 shall be retired as brigadier-generals.

(8) The enlisted strength of the Corps was increased to 14,981. The President is authorized to further increase it to 17,400 in case of emergency.

(9) A Marine Corps Reserve, corresponding to the classes of the Naval Reserve Forces, is established.

The Naval Militia.—For the Naval Militia $1,270,737.73 was appropriated for pay and upkeep for the year 1917. The main features of the Naval Appropriation Act affecting the Militia are:

(1) Annual retainer fees are provided of $500 for lieutenants and above, $240 for lieutenants (junior grade), $200 for ensigns, and $120 for warrant officers, provided they have attended the prescribed drills.

Enlisted men receive 25 per cent. of the base pay of similar active ratings as retainer fee if they attend all prescribed drills, or a proportionate amount if not attending all drills. In order to receive this retainer fee they must enroll in the National Naval Volunteers.

Government employees suffer no losses due to service in the Naval Militia.

No part of the Naval Militia may be disbanded without the consent of the President.

In case of emergency the President may enroll any or all of the Naval Militia into the "National Naval Volunteers," who may be drafted into the regular naval service and be subject to the laws. Term of enlistment is three years.

Aeronautics. — The aeronautical strength of the Navy (October, 1916) comprised of three kite balloons, seven aeroplanes, and two flying boats. These aircraft range from 60 h.p. to 140 h.p. Thirty-three commissioned officers, qualified as pilots, make up the Flying Corps. There are 14 commissioned officers under instruction, and 55 aeroplanes and one experimental dirigible are being constructed. There are no other reserves in either personnel or material. (See also XXI, *Aeronautics.*)

The Appropriation Act provided that the Naval Flying Corps shall consist of 150 officers and 350 men, these in addition to the regular naval establishment. The Secretary of the Navy may appoint 15 civilians (or warrant officers or men) each year to be acting ensigns for a probationary period of three years. If qualified they may then be appointed acting lieutenant (Junior grade) for a four-year probationary period. If again qualified, they are then commissioned lieutenant in the Flying Corps. These officers, if qualified, may be commissioned in the regular line of the Navy or Marine Corps as extra members. They are eligible for transfer to the Naval Reserve Flying Corps or may be regularly promoted until they reach the grade of captain in the Navy or colonel in the Marine Corps (serving at least three years in each grade). In addition, the Secretary is authorized to appoint 30 enlisted men or civilians a year for four years as student flyers, who shall receive the pay and allowances of midshipmen at the Naval Academy. If they do not qualify as aviators within two years the appointment is revoked, or they may be transferred to the Reserve Flying Corps as ensigns. If they do qualify they may be appointed, after three years' service, acting ensigns or, at their own request, be transferred to the Reserve. In case of accident to or death of persons engaged in aviation duties, the gratuities and pensions are doubled.

The Reserve Flying Corps is to be composed of officers transferred from the Flying Corps, as above noted, and of those men who shall be entitled to an honorable discharge after 16 years of service.

For the fiscal year 1916-17 Congress appropriated $3,500,000 for naval aeronautical purposes and an additional $85,000 for the expenses of the Advisory Committee.

Naval Preparedness.—On July 1, 1914, the United States Navy was third in rank in regard to total tonnage built and building. France was closely pressing us for third place. But the other leading nations had a reserve force in personnel as follows: England, 43 per cent.; Germany, 104 per cent.; France, 149 per cent.; while the U. S. Naval Reserves were only 12 per cent. of the active personnel. All things considered, it is clearly evident that the United States ranked fourth in naval power.

The great war had waged about a year before this country awoke to the unpleasant truth of its real condition and its relative standing. The political party in power then began to realize that the nation demanded "preparedness." President Wilson then directed the Secretary of the Navy to draw up a shipbuilding program (*A. Y. B.*, 1915, p. 323). The Secretary decided that $500,000,000 expended for new construction in the next five years would meet the demands and needs of the nation, and he directed the General Board to draw up a plan under these conditions. The General Board submitted a programme, calling for an expenditure of practically $500,000,000. The Secretary modified this plan, increased it by two millions, and submitted his recommendations calling for the expenditure of $502,482,214. As the months of debate in Congress on the Naval Appropriation bill wore on (see I, *The Sixty-Fourth Congress*) the President decided that the country needed more preparedness than the Secretary had estimated. This necessity was met by the simple expedient of modifying the time limit of the above programme, so that now we are to carry out the scheme in three instead of five years (for details see *supra*). Furthermore, the Secretary is authorized to increase the total cost of any vessel not to exceed 20 per cent. as a bonus for speedy construction.

This programme, which may or may not be completely carried out, depending upon the pleasure of the President, will probably keep the United States Navy third in relative rank, considering the total tonnage only. It will not be sufficient to equal England's Navy nor to deprive Germany of second place. In fact, France and Russia will continue to crowd us for third place, with Japan not far behind. We have not advanced our relative position among the naval powers of the world by means of this programme. We are barely keeping pace with them.

XIII. ECONOMIC CONDITIONS AND THE CONDUCT OF BUSINESS

S. S. Huebner

BUSINESS CONDITIONS IN 1916

A Year of Unprecedented Business Activity.—Business in the United States today is on a war basis, and practically all the business barometers customarily used in gauging the degree of activity in finance, manufactures and commerce, simply reflect that abnormal condition. That the war in Europe has greatly increased the volume of business, as well as profits on that business, in those industries favored directly by large orders for foodstuffs, munitions and war supplies of all kinds, cannot be disputed. These industries, in turn, have been obliged to purchase equipment and raw material on a large scale from innumerable other sources. Since business is largely a unit, the stimulating influence of huge war orders has favorably affected, directly or indirectly, a very large number of American industries, and has brought about one of the greatest business booms ever experienced by this nation, and this at a time when most of the other leading industrial countries are suffering the reverses of a destructive war. While discussions of a possibly unfavorable aftermath of the war are becoming increasingly numerous, the general tone of financial and trade journals is still distinctly optimistic. Business activity seems still to be actuated largely by belief in the prosecution of the world's greatest war for some time to come, with the prospect of large foreign war orders and continued enormous war profits.

As already stated, practically all the leading barometers of trade furnish evidence of unusual prosperity. Merchandise is leaving our ports at a rate of 1.9 times the amount shipped at the beginning of 1915, while the balance of trade in our favor is nearly 2.4 times as large. Moreover, the impetus towards even greater exports seems to be gaining strength. Comparing the figures of the last month of 1916 for which they are obtainable with those of the corresponding month of 1915, railroad gross and net earnings show increases of nearly 19 and 28 per cent., respectively, bank clearings of 27 per cent., and new incorporations of over 30 per cent. Business failures, on the other hand, have decreased 16 per cent. in number and nearly 50 per cent. in the volume of liabilities. On the same basis of comparison, pig-iron production has increased over 12 per cent., and the unfilled tonnage of the U. S. Steel Corporation nearly 80 per cent. Unfortunately, reliable figures of copper production are not available, but press reports indicate huge shipments to the Allies and large orders for future delivery, the price in the meantime advancing during the year by 57 per cent. Probably not less than half of this country's metal output, it has been estimated, is now going for war purposes. Automobile sales during the first six months of the year, we are told, were smaller than the entire 1915 output by only 15 per cent. (see also XXI, *Automobiles*). The shipbuilding industry is also enjoying unprecedented prosperity, attributable chiefly to war conditions, and the number of steel merchant vessels under construction in American yards is reported to be five times as great as at the end of 1915.

Fortunately, owing to huge gold imports and the effects of the Federal Reserve Act, this business activity has been accompanied throughout the year by a plentiful supply of credit at extraordinarily low rates. Surplus

reserves of the New York Clearing House banks, under the new system, stand at $107,000,000, despite an increase in loans since the beginning of 1915 of 52 per cent. This favorable credit situation, in turn, has had not only a marked influence on the enlargement of many business enterprises, but has insured in the main the maintenance of the high price level of corporation shares attained during 1915. Here it should be remembered that, as regards the shares of war-serving corporations, the stock market has witnessed during the past two years a speculative craze probably without parallel in history.

As might be expected, the prosperity of 1916, especially since we have experienced a serious shortage in leading crops, has been accompanied by rapidly rising prices in nearly all commodities vitally affecting the home and industry, and also by increased wage demands on the part of labor. The extent of price increases has been truly phenomenal. Comparing New York cash prices for staple commercial products at the middle of November with those at the same time in 1915, the following increases will indicate the violence of the upward trend: No. 1 spring wheat, $1.16¼ to $2.10½; No. 2 yellow corn, $0.75¼ to $1.15¼; flour, $5.50 to $9.80; lard, $9.35 to $18.00; pork, $16.50 to $31.50; beef, $18.75 to $25.50; sugar, $6.00 to $7.50; No. 1 foundry iron, $17.00 to $29.00; Pittsburgh steel billets, $26.00 to $52.50; copper, $19.00 to $35.00; cotton, $11.70 to $20.20; and print cloths, 3½ to 6 cents. Such price movements along practically all lines, combined with scarcity of labor, have led to numerous wage demands, which, however, in most instances have been granted or compromised without the occurrence of prolonged and costly strikes (see XVI, *Labor*). In fact, all the adverse factors of the year which would usually play a prominent part in influencing the course of business and security prices, unsettled labor conditions, rapidly rising commodity prices, a serious crop shortage, and the ultimate destructive effects of the world's greatest war, seem thus far to have been ignored.

Statistics. — Following the plan adopted in previous issues of the YEAR BOOK, we present a series of tables which summarize the business conditions of 1916 in comparison with those of 1915 and earlier years, as shown by those leading indices which are generally accepted as the truest barometers of industry, trade and finance. The tables relating to stock-market activity, including summaries of "Shares of Stocks and Bonds Sold," "Average Security Prices," and "New Securities Listed," indicate the activity or lack of activity during the year in the security market and the condition of the investment demand. The tables relating to "Loans and Deposits of the New York Clearing House Banks" and "Domestic and Foreign Money Rates" furnish an idea of the conditions surrounding the money market during 1916, while the tables on "Bank Clearings," "Foreign Trade," "Cereal Production," "Railroad Earnings," "Idle Cars," "Production of Iron and Copper," "Building Construction," and "Business Failures," serve to furnish a view of the year's activity in mercantile and manufacturing lines. For purposes of comparison, the figures are given by months for the years 1915 and 1916, and to make possible a further comparison, the totals for the several items wherever possible are given also for 1914 and 1913.[1]

AGRICULTURE

Crop Production.—The grain-crop statistics of the United States for 1916, as indicated by the October estimates of the Department of Agriculture, present a very unfavorable showing as compared with the excellent returns of 1915 and 1914. In fact, our crop returns constitute the one dismal item in the year's unusually favorable business record. Considering

[1] The author is indebted for many of the statistics presented in the following tables to the monthly compilations prepared from authentic sources by R. W. Babson, and issued periodically in "Babson's Desk Sheet of Tables on Barometric Figures for Business Conditions." In the collection of data much assistance has been obtained also from the excellent compilations and reviews published periodically by the *Commercial and Financial Chronicle*, the *Journal of Commerce and Financial Bulletin*, the *Economic World*, and the *Iron Age*.

the five leading cereals, wheat, corn, oats, barley and rye, the estimated yield for 1916, as indicated by the accompanying table, shows a total of only 4,782,000,000 bus. as contrasted with 5,893,000,000 bus. in 1915, a decline of slightly over 18.8 per cent. Estimates of all the leading cereals show a material falling off from the preceding year, and the total decline for the five leading grain crops aggregates 1,111,000,000 bus. Unfortunately, other leading farm products, especially potatoes, also show a severe decline. (See also XVII, *Agriculture.*)

The year's wheat crop is estimated at only 608,000,000 bus. as compared with 1,002,000,000 bus. in 1915 and 892,000,000 bus. in 1914, a decrease respectively, of 39.2 per cent. and 31.8 per cent. The decline occurred in both winter and spring wheat, but particularly in the latter. Winter wheat yielded only 455,000,000 bus. as contrasted with 655,000,000 bus. in 1915, and the yield per acre was 13.8 bus., as compared with 16.2 bus. Spring wheat yielded only 153,000,000 bus., as compared with 357,000,000 in 1915, and the yield per acre was only 8.6 bus. as compared with 18.3 in 1915. It should be observed also that the acreages devoted to winter and spring wheat were only 81.9 and 91.8 per cent., respectively, of the acreage during the preceding year. Moreover, the food value of the 1915 wheat crop is much below the average, the Department of Agriculture announcing, on the authority of mills and elevators, that the average weight of a measured bushel of spring wheat is only 51.4 lb., as compared with the usual weight of 57.5 lb.

Corn, the nation's leading crop, shows an estimated decrease of 337,000,000 bus., or over 11 per cent. The condition of the crop is only 71.5, against 79.7 in 1915 and a ten-year average of 77. Most of the remaining important agricultural crops also present an unfavorable showing as compared with 1915. The yield of oats is placed at only 1,230,000,000 bus., approximately 20 per cent. less than in 1915, while the quality is slightly better. The barley crop is estimated at 184,000,000 bus., or over 22 per cent. less than in 1915. For rye the estimated yield is 42,000,000 bus., a decline of over 14 per cent.; for white potatoes, 300,000,000 bus., a decline of over 16 per cent.; for apples, 66,000,000 bbls., a decline of nearly 14 per cent.; and for peaches 36,900,000 bus., a decline of nearly 42 per cent. Cotton and hay, it is true, show increased yields as compared with 1915, but the percentages are respectively only four and one per cent. Only in the case of flax, rice and tobacco do the yields show the substantial increases of 11, 11, and 14 per cent, respectively.

CEREAL PRODUCTION
(000,000 omitted)

Production (bushels)	1916[1]	1915	1914	1913	1912	Previous Records	
Winter wheat	455	655	685	523	400	685	(1914)
Spring wheat	153	357	206	240	330	357	(1915)
Corn	2,718	3,055	2,673	2,447	3,125	3,125	(1912)
Oats	1,230	1,540	1,141	1,122	1,418	1,540	(1915)
Barley	184	237	195	178	224	237	(1915)
Rye	42	49	43	41	36	49	(1915)
Total	4,782	5,893	4,943	4,551	5,533	5,993	

[1] October estimate; the final December estimate is given under XVII, *Statistics of Agriculture.*

Cotton Production.—The Government's October statement places the condition of the cotton crop at 56.3, as compared with 60.8 for 1915, 73.5 for 1914, 64.1 for 1913, and 67.2 for the ten-year average. The estimated yield for 1916 is placed at only 11,637,000 bales, or approximately 445,000 bales in excess of the small 1915 yield. It should be noted that for the last two years the cotton crop has been less than 12,000,000 bales, as compared with the 1914 crop of 16,135,000 bales. The unusually small crop of 1916 is chiefly traceable to the very poor condition of the staple and not to decreased acreage as was the case in 1915 (*A. Y. B.*, 1915, p.

327). In 1916, 35,994,000 acres were devoted to cotton, or a total planted area 12 per cent. larger than in 1915. The yield, however, was only 156.3 lb. per acre, as compared with 170.3 lb. in 1915. (See also XVII, *Agriculture.*)

Prices of Staple Agricultural Products.—Owing to short crop returns, combined with huge export demands and unfavorable crop conditions in Canada and Argentina, current prices of agricultural products have reached a level very much higher than in 1915. The following table of farm prices prevailing on Oct. 1, as published by the Department of Agriculture, shows a material increase in the general level of farm prices (for December prices see XVII, *Statistics of Agriculture*). Thus it appears that the average price for the five leading cereals, wheat, corn, oats, barley and rye, was 88.7 on Oct. 1, 1916, as compared with 64.8 on the corresponding date of 1915, an increase of 37 per cent. Moreover, potatoes were selling at $1.12, as compared with 48.8 cents in 1915, flaxseed at $1.992 as compared with $1.481, and cotton at 15.5 cents as compared with 11.2 cents. The farm prices of the products named on Oct. 1 of each of the three years 1914-1916 were as follows:

	1916	1915	1914
Wheat (bu.)	$1.363	$0.909	$0.935
Corn (bu.)	0.823	0.705	0.782
Oats (bu.)	0.445	0.345	0.433
Barley (bu.)	0.765	0.468	0.518
Rye (bu.)	1.041	0.817	0.790
Buckwheat (bu.)	0.904	0.737	0.787
Potatoes (bu.)	1.120	0.488	0.647
Sweet potatoes (bu.)	0.837	0.727	0.873
Flaxseed (bu.)	1.992	1.481	1.274
Hay (ton)	10.360	10.690	11.770
Cotton (lb.)	0.155	0.112	0.078

On Oct. 24 Chicago December wheat was quoted at $1.68¾, as compared with $1.03⅛ a year before and a previous October high of $1.17½ in 1914. Since that date Chicago December wheat has sold as high as $1.90 per bushel, a higher price than that obtained during the famous Leiter corner and the highest since the Hutchinson corner in 1888 when the high quotation was $2.00. December corn was quoted on Oct. 24 at $0.82¼, as compared with $0.58 a year before and a previous October high of $0.70⅝ in 1914. New York October cotton was quoted at 18.15 cents, as compared with 12.27 cents a year before and a previous October high of 14.96 cents in 1913.

IRON AND STEEL TRADE

Iron Production.—Large war orders have had a marked effect on the iron business of the country, which is now enjoying an unparalleled prosperity (see also XVIII, *Iron and Steel*). Present production is at the rate of 3,202,000 tons a month, or twice that of 1,601,000 for January, 1915. Every month of 1916 showed a production exceeding the three-million ton mark. For the first nine months of the year total production amounted to 25,841,000 tons, an increase of nearly 48 per cent. over the first nine months' production of 1915, which in turn exceeded that of 1914 by over one million tons. Total production for the year reached the huge sum of 35,000,000 tons. Prices likewise have had a remarkable rise. At the middle of November the price of pig iron No. 2 So. at Cincinnati was $20.90, compared with $15.90 in 1915 and a previous high average of $21.83 in 1906. Reviewing price movements in the iron industry, the *Iron Age*, in its issue of Nov. 9, states the situation as follows:

> Last week's sensational advances in pig iron did not check but rather stimulated buying, but the market is in confusion over wide variations in prices and the withdrawal of a good many sellers, particularly on business for the second half of 1917. Some of the new advances are without a parallel for a single week. Virginia iron, which last week sold at $19.50, is now $24. Eastern Pennsylvania basic, quoted last week at $21.50, is now $25. Lake Superior charcoal iron, Chicago, has gone from $20.25 to $25. Southern No. 2 iron has sold at $18, Birmingham, in the past two days, and some sellers got $20, while two important producers are out of the market.
>
> In the Central West, Bessemer iron has sold at $27, Valley furnace, and basic at $23, an advance of $1 for both. The buying of steel-making iron for export promises to keep up, and a rising market is indicated.

The Steel Trade.—Present figures indicate clearly that the steel trade is experiencing the greatest boom in

PRODUCTION OF IRON AND COPPER

	Pig Iron		Copper			
	Production, Tons		Production, Pounds		Visible Supply, Pounds	
	1915	1916	1915[1]	1916	1915[1]	1916
January	1,601,000	3,185,000	85,000,000		173,641,000	
February	1,675,000	3,087,000	90,000,000		145,000,000	
March	2,064,000	3,338,000	105,000,000		168,000,000	
April	2,116,000	3,228,000	115,000,000		150,000,000	
May	2,263,000	3,351,000	120,000,000	No	120,000,000	No
June	2,381,000	3,212,000	130,000,000	Reliable	100,000,000	Reliable
July	2,563,000	3,226,000	135,000,000	Figures	118,000,000	Figures
August	2,780,000	3,204,000	140,000,000	available	122,000,000	available
September	2,853,000	3,202,000	147,000,000		126,000,000	
October	3,125,000	3,509,000	155,000,000		130,000,000	
November	3,037,000	3,312,000	165,000,000		107,000,000	
December	3,203,000	3,179,000	200,000,000		84,660,000	

[1] Estimated.

its history, a situation traceable in large part to the immense amount of steel required for the completion of war orders. The volume and profitableness of the business are indicated by the record of unfilled orders and the net earnings of the U. S. Steel Corporation. Unfilled orders of the Corporation, usually considered an excellent index of trade, show an average of 9,334,119 tons for the first nine months of 1916, compared with 4,567,705 tons for the corresponding period in 1915 and 4,306,846 tons in 1914. In November unfilled orders exceeded the ten-million ton mark, compared with 7,806,000 tons during December, 1915, 4,928,000 tons during July, 1915, and only 3,836,000 tons during December, 1914. The totals of unfilled orders by months for the last three years are as follows:

	1914	1915	1916
January	4,613,680	4,248,571	7,922,767
February	5,026,440	4,345,371	8,568,966
March	4,653,825	4,255,749	9,331,001
April	4,277,068	4,162,244	9,829,551
May	3,998,160	4,264,598	9,937,798
June	4,032,857	4,678,196	9,640,458
July	4,158,589	4,928,540	9,593,592
August	4,213,331	4,908,455	9,660,357
September	3,787,667	5,317,618	9,522,584
October	3,461,097	6,165,452	10,015,260
November	3,324,592	7,189,489	11,058,542
December	3,836,643	7,806,220	11,547,286

All accounts indicate also that the industry is thriving on rapidly improving prices as well as from heavy orders. Referring to the financial statement of the U. S. Steel Corporation for the September quarter, the *Commercial and Financial Chronicle* concludes that

> present conditions are unique and grow entirely out of the great conflict in Europe. . . . We have the twin advantages of a large output combined with extremely high prices for all classes of iron and steel products, finished and unfinished, and in some instances, with prices without a parallel in recent times.

Net earnings, after allowing for expenses and for interest on the bonds of subsidiary companies, amounted to $85,815,067, compared with $81,126,048 in the June quarter of 1916, with $38,710,644 in the September quarter of 1915, and with only $22,706,002 in the September quarter of 1914. The September quarter's earnings of $85,000,000 exceeded the total earnings for all of 1914 ($71,663,615) by over $11,000,000. September earnings of $30,420,150 exceeded those of any preceding month, while in January, 1915, earnings amounted to only $1,687,150. Even allowing for the quarterly dividend of 2¼ per cent. on the common stock and 1¾ per cent. on the preferred, surplus earnings for the September quarter amounted to the unprecedented total of $51,859,450. But despite these large profits of the Steel Corporation, which are generally considered as typical of the steel trade as a whole, prices of steel are still rising and the end of the movement is not yet in sight. As is pointed out by the *Iron Age* in its issue of Nov. 9:

> The rise in finished steel products goes on. On black sheets the leading interest, which is now practically sold up for the first half, has made advances of $2 to $3 a ton. It has fol-

lowed independent tin plate makers in putting its price at $6 per base box, or 25 cents above its first sales for the first half. Wire nails were advanced $3 on Nov. 6, or to $2.85, while fence wire has gone from $2.65 to $2.80, and woven wire fencing is up $6 a ton. On the leading finished steel products —plates, structural shapes and bars— some mills are refusing to quote for next year except on specific amounts to cover contracts in the hands of manufacturing consumers. In plates the inability of the mills to cope with the demand is more pronounced and prices are telling the story.

COPPER TRADE

The prosperity noted in the iron and steel business has been fully duplicated in the copper industry also, but unfortunately no reliable figures of production are available for the year (see also XVIII, *Copper*). It is certain, however, that the domestic and foreign demand for the metal, owing largely to the increased needs of the belligerent nations, has been very much larger than during 1915, when, according to the statistics of the U. S. Geological Survey, the production of primary copper by the refining plants of the country was 1,634,204,448 lb. Statistics recently issued by Secretary Mayer of the New York Metal Exchange show that exports of copper for the first eight months of 1916 (not including those to British North America and Mexico) amounted to 215,199 long tons, as compared with only 171,786 tons for the corresponding months of 1915. These figures are noteworthy also in that they show that four of the belligerent nations, Great Britain, France, Italy and Russia, received 200,557 tons, or over 93 per cent. of the total exports for the first eight months of the year. France received over 105,000 tons, while Great Britain and Italy took respectively 51,738 and 31,143 tons.

That American production and exportation of copper are materially larger now than in 1915 or during the first half of 1916 is clearly indicated by recent press accounts. Toward the close of September announcement was made that the Entente Allies had arranged a contract through J. P. Morgan & Co. for the delivery of 200,000 long tons (448 million pounds) of copper, the delivery to begin in January, 1917, at the rate of 75 million pounds monthly, and, according to reports, at a price somewhat in excess of 27 cents per pound, or approximately $125,000,000 for the entire contract. This is the largest order for copper ever concluded anywhere and amounts to more than two-thirds of the total copper exports for the entire year 1915, and more than one-half of annual exports in any previous year. Press accounts indicate also that domestic production is reaching unprecedented figures. The American Brass Co., for example, is reported as requiring 40 million pounds of copper a month, or at the rate of 480 million pounds a year. Other American concerns, particularly those engaged in turning out war munitions, are consuming the metal on a proportionately larger scale.

Despite the greatly enlarged output, the metal has shown a sensational advance in price, namely, to 28.75 cents (electrolytic copper at New York) for October, 1916, compared with 17.98 cents a year before and 11.32 cents in 1914. In turn the heavy demand for the metal at greatly increased prices has had a material effect upon the quotations of leading copper shares. At the beginning of October the purchase price of Babson's list of 20 active and representative copper stocks was 57.1, compared with 28.6 late in 1907, 60.8 in August, 1909, and 31.9 in December, 1914. It is the consensus of opinion also that the pressure of demand at remarkably high prices has led to a material enlargement of copper-refining facilities, as well as the opening of many mines whose operation had been discontinued as unprofitable some years before the war. Recent estimates place the present annual copper-refining capacity of the United States at approximately 2,225,000,000 lb.

FOREIGN TRADE

The discussion of the country's foreign trade in the last issue of the YEAR BOOK (p. 329) emphasized the fact that we were dealing with an abnormal situation. The same condition has prevailed during the year

1916, and the country's exports, due to the same causes, vastly exceeded even the remarkable record of 1915. Again, as was stated last year, "wholly as a result of the European War, certain of the belligerents have made such demands upon us for supplies and materials necessary for the prosecution of the conflict as to create a most extraordinary balance of trade in our favor, this balance, however, being confined to a comparatively limited number of commodities." Exports of merchandise in the calendar year 1915 amounted to $3,546,560,018, against $2,113,624,050 in 1914 and $2,484,018,292 in 1913. Imports of merchandise, on the other hand, remained practically constant during the three years, being respectively $1,778,596,695, $1,789,276,001 and $1,792,596,480. The net balance of American exports for 1915 therefore reached the huge total of $1,767,963,323, as compared with only $324,348,049 in 1914 and $691,421,812 in 1913.

Foreign trade returns for 1916, however, far exceed the fondest expectations and show, as does no other business barometer, the large part played by war orders in our present prosperity. Exports of merchandise during the first eight months of the year amounted to the unprecedented total of $3,435,872,580, and exceeded the imports by $1,768,805,615. Although our foreign-trade balance of $1,080,028,442 for the first nine months of 1915 was the subject of endless comment, being considerably more than twice that for the corresponding period of any previous year, it is noteworthy that the balance for the first nine months of 1916 is larger by nearly 689 millions. For purposes of comparison it may be stated that the record balance of trade in former years was $666,431,554 in the fiscal year 1907-1908. Yet impetus towards even greater imports seems to be gaining strength. For the month of September exports reached the unprecedented total of $515,007,408, and while they receded in October, in November they reached the new high record of $516,976,359. The September record exceeded any previous month of the present banner foreign trade year by 40 millions, and represents a balance of trade of 350 millions, or over 2.6 times that of August, 1915, when the balance was slightly less than 119 millions. Prior to the war, 278 millions represented the greatest value of merchandise exports for any month (November, 1912); then followed in succession the records of February, 1915 (300 millions); October, 1915 (336 millions); December, 1915 (359 millions); March, 1916 (410 millions); May, 1916 (474 millions); August, 1916 (510 millions); September, 1916 (515 millions); and November, 1916, with nearly 517 millions. As pointed out by the *Commercial and Financial Chronicle* in connection with the August record:

> This 510-million aggregate is not merely a high record of monthly exports for the United States; it stands as a high water mark for any country or empire of the world by a considerable amount, as do all the totals beginning with February, but in lesser degree. . . . The August exports of 510 millions is at a ratio that meantime would show the outward trade of the United States to be about one-third of that of the whole world in normal times.

Such a ratio, of course, no one expects to continue following the return of peace, and the discontinuance of the extraordinary demands upon us by the Entente Allies. The United States is just now the beneficiary of large war orders at extraordinary prices and the high totals of our exports are the result of a purely temporary condition entirely inapplicable to the future. Yet, while they last, these large war orders serve as a remarkable impetus to all industries engaged directly or indirectly in filling and delivering them. To a very large extent, it should be stated, our large export figures are due to exceptionally high prices, as compared with the years preceding the war, and this is especially true of explosives, metals and other war materials, which are now leaving our shores in unusual quantities.

A further analysis of our foreign-trade returns shows two important features, both emphasizing the importance of war conditions. The first relates to the great increase in exports to Great Britain, France, and Russia. On the one hand Great Britain alone, between Jan. 1 and the end of September, has contributed nearly

FOREIGN TRADE

	Imports		Exports		Balance of Trade	
	1916	1915	1916	1915	1916	1915
January	$183,350,942	$122,148,317	$330,036,410	$267,879,313	$145,685,468	$145,730,996
February	193,935,117	125,123,391	401,783,974	299,805,869	207,848,857	174,682,478
March	213,589,785	157,982,016	410,742,034	296,611,852	197,152,249	138,629,836
April	218,236,397	160,576,106	398,568,532	294,745,913	180,332,135	134,169,807
May	229,188,957	142,284,851	474,803,637	274,218,142	245,614,680	131,933,291
June	245,795,438	157,695,140	464,686,846	268,547,416	218,890,518	110,852,276
July	182,722,938	143,244,737	444,716,964	268,468,702	261,994,026	125,223,965
August	199,316,480	141,804,202	510,167,438	260,609,995	310,850,958	118,805,793
September	164,038,614	151,236,026	515,007,408	300,654,921	350,968,794	149,440,796
October	176,423,897	149,172,729	490,613,280	336,152,009	314,189,383	178,846,360
November	176,988,305	155,496,675	516,976,359	327,670,353	339,988,054	172,173,738
December	.....	171,832,505	.....	359,306,362	.....	187,473,987

one-half our balance of trade. In strong contrast to this situation stands the fact that, excluding blockaded Germany, Austria and Belgium, no less than 17 out of 21 important countries have sent larger imports to the United States during the first half of 1916 than they did during the corresponding period of 1915. The second feature to bear in mind is the greatly increased importance which certain articles, many of them very unimportant before the war, play in our export trade. The following tabulation published in August (Babson's report of Aug. 29) shows that exports of 14 groups of articles during the preceding ten months amounted to nearly $1,796,300,000, as compared with only $497,823,000 for the ten months preceding the war:

Exports	Ten Months Ending July, 1916	Ten Months Ending July, 1914
Mules and horses	$73,000,000	$3,500,000
Brass, bronze, etc	155,000,000	6,000,000
Automobiles and parts	16,000,000	20,000,000
Railway cars	21,000,000	10,000,000
Aeroplanes	6,300,000	195,000
Chemicals	93,000,000	22,000,000
Motorcycles	2,700,000	900,000
Cotton goods	88,000,000	43,000,000
Iron and steel	472,000,000	212,000,000
Shoes and leather	120,000,000	47,000,000
Canned goods, meat and dairy products	231,000,000	124,000,000
Wool and woolen goods	45,500,000	3,900,000
Zinc, etc	36,800,000	328,000
Explosives	336,000,000	5,000,000
	$1,796,300,000	$497,823,000

The comparison shows that exports of six of these groups, mules, horses, brass, bronze, etc., automobiles and parts, chemicals, zinc, etc., and explosives, comprised a total of nearly $810,000,000 for the ten months ending July, 1916, against only $57,000,000 for the ten months preceding the beginning of hostilities, an increase of nearly 15 fold.

The huge balance of trade already referred to should not cause us to lose sight of the fact that our imports of merchandise during the first eight months of 1916 are also the greatest on record, totaling $1,667,066,965. This compares with $1,150,858,760 for the corresponding months of 1915 and with a previous high record of $1,270,361,263 in 1914. The exceptional present showing is traceable chiefly to the increased purchasing power of the country, owing to the present wave of prosperity. (See also XX, *External Commerce of the United States.*)

BUILDING OPERATIONS

The figures of new building construction during 1916 reached exceedingly high totals for every month and stand in striking contrast to the poor showing recorded during the preceding two years (*A. Y. B.*, 1915, p. 331). In fact, the year's operations for the first eight months, the latest figures available, at the time of writing, for the country as a whole, exceeded those of any previous year. New York City shows an increase of nearly 54½ millions for the first eight months of the year, or nearly 43 per cent., as compared with the corresponding period of 1915. This increase, equal to nearly a third of that recorded by the *Commercial and Financial Chronicle* for 159 cities, is in part attributable to the desire to file

BUILDING CONSTRUCTION
(20 Leading Cities)

	1915	1916
January	$26,693,647	$34,688,631
February	30,057,773	33,495,089
March	46,430,160	54,938,059
April	49,863,072	56,271,635
May	53,102,523	67,326,185
June	40,206,351	63,612,337
July	40,472,174	87,947,719
August	44,764,018	39,292,235
September	42,971,076	39,988,938
October	43,472,626	56,307,117
November	43,031,947	43,367,261
December	44,874,679	47,120,433

plans before the going into effect of a prospective change in the building regulations placing restrictions upon the height of structures (see VII, *City Planning*). In various other sections of the country the large figures reflect in part the extension of plants engaged in the filling of war orders. In presenting the results (for August) of its compilation of building operations for which contracts were arranged at 159 cities of the country, the *Commercial and Financial Chronicle* says:

For the eight months this year's operations in Greater New York have been much greater than in 1915 or 1914, $179,626,975, comparing with $125,177,087 and $105,237,200, the Borough of Manhattan being responsible for the gain over last year. Outside of this city the increase over a year ago is 97 million dollars ($509,510,729 contrasting with $412,682,047) and for the country as a whole (159 cities) the projected expenditures involved, at $689,137,704, is the largest of any year in our history, comparing with $537,859,134 in 1915 and 666 millions in 1912—the previous high record. Needless to say, all the various groups into which our returns are segregated share in the current year's gain.

BUSINESS FAILURES

In the 1915 issue of the YEAR BOOK (p. 332) it was explained that while the record of business failures during 1915, as contrasted with the poor failure situation during 1914, showed no improvement in the number of failures, there was a distinct improvement in the total liabilities involved. In 1916, however, the failure situation is very favorable both as regards number and total liabilities. During the first nine months of 1914 and 1915 the number of failures totaled, respectively, 12,189 and 15,987, and the total liability of failures, $258,248,719 and $229,822,336. The showing of 1916 for the corresponding months, however, shows a decrease of 19.3 per cent. in the number (12,899) as compared with 1915, and of 38 per cent. in the liabilities involved ($141,975,460).

A further analysis of the figures shows fewer and less serious failures in the three main divisions of business activity; manufactures (see XIX, *Manufactures*), commerce and finance. The comparative improvement for 1916 over 1915 is well summarized by the *Commercial and Financial Chronicle* in the following:

The exhibit for the third quarter of the current year (July-September inclusive) is the best for the period since 1913 as regards number, and for an aggregate of indebtedness less than now recorded—$43,345,286—we have to go back to 1911. The 1915 total was $52,876,525, and that of 1914 no less than $86,818,291, important brokerage failures contributing largely to it. Here also a considerable decline from a year ago is shown in the liabilities in the trading and miscellaneous divisions. Manufacturing defaults this year stand

BUSINESS FAILURES
(Average of Dun and Bradstreet Reports)

	Liabilities		Number		Totals for Year	Liabilities	Number
	1915	1916	1915	1916			
January	$50,108,578	$21,521,632	2,613	1,890	1908	$259,341,727	14,873
February	28,674,137	18,320,005	2,072	1,649	1909	146,763,569	12,430
March	26,914,870	17,315,337	1,983	1,647	1910	195,223,045	12,109
April	38,734,038	15,747,016	1,868	1,331	1911	189,358,591	13,062
May	19,595,994	18,122,176	1,572	1,443	1912	202,085,974	14,647
June	19,078,467	9,960,442	1,620	1,240	1913	282,232,584	15,296
July	17,177,926	10,902,872	1,591	1,186	1914	358,391,742	17,531
August	15,698,314	18,009,594	1,335	1,352	1915	294,182,806	20,602
September	15,992,354	12,393,539	1,346	1,163	1916	196,212,256	16,993
October	21,234,425	11,146,182	1,476	1,248			
November	17,696,619	11,832,086	1,481	1,251			
December	23,277,084	14,945,903	1,645	1,252			

RAILROAD GROSS AND NET EARNINGS
(Commercial and Financial Chronicle)

Section or Group	Gross Earnings			
	Jan. 1 to June 30		Increase(+) or Decrease(—)	
	1916	1915	Total	Per Cent.
Group 1 (18 roads), New England	$81,217,008	$68,109,814	+$13,107,194	19.24
Group 2 (88 roads), East and Middle	483,345,220	387,487,868	+95,857,352	24.79
Group 3 (64 roads), Middle West	215,991,487	162,749,807	+53,241,680	32.39
Groups 4 and 5 (97 roads) Southern	225,484,973	183,928,035	+41,556,938	22.60
Groups 6 and 7 (79 roads) Northwest	364,731,333	290,845,851	+73,885,482	25.40
Groups 8 and 9 (100 roads) Southwest	257,951,110	225,442,425	+32,508,685	14.44
Group 10 (44 roads), Pacific Coast	102,739,781	84,884,534	+17,855,247	21.12
Total (490 roads)	$1,731,460,912	$1,403,448,334	+$328,012,578	23.37

	Mileage		Net Earnings			
	1916	1915				
Group 1	7,828	7,834	$24,739,232	$20,100,713	+$4,638,519	23.07
Group 2	29,684	29,578	150,941,073	109,359,055	+41,582,018	38.07
Group 3	23,280	23,677	68,071,011	36,396,199	+31,674,812	87.45
Groups 4 and 5	42,221	42,124	79,538,150	52,515,813	+27,022,337	51.47
Groups 6 and 7	68,907	68,426	124,262,558	86,859,206	+37,403,352	43.09
Groups 8 and 9	58,791	58,520	73,827,254	59,534,657	+14,292,597	24.01
Group 10	18,538	18,336	37,997,616	28,459,864	+9,537,752	33.47
Total	249,249	248,495	$559,376,894	$393,225,507	+$166,151,387	42.26

for $20,317,919, against $26,322,788, and brokers, etc., for $5,084,713, against $7,099,656.

The failures for the nine months of 1916, while fewer in number than in 1915, exceeded in that particular all earlier years, but as the number of firms in business is steadily increasing, this is not at all surprising. The volume of indebtedness for the period in the current year is, however, as noted above, very much less than in either of the three preceding years, and comparatively moderate withal. Insolvencies for the period this year were 13,250, against 17,288 in 1915 and 12,841 in 1914, and the liabilities involved reached $154,586,707, against $241,464,060 and $271,918,021, respectively. Manufacturing indebtedness totaled $59,214,661, against $89,698,009 in 1915, with the situation most favorable as compared with a year ago, in machinery and tools, and lumber, etc. Trading liabilities of $74,017,524 compare with $123,691,220, the decrease being largely in dry goods and carpets, clothing and furnishings, and general stores. The failed liabilities of brokers, agents, etc., at $21,354,522 contrast with $28,074,831. Bank, etc., suspensions in the nine-month period, numbered 41 for $9,487,779, as against 106 for $23,095,245 in the preceding year.

RAILROAD EARNINGS

The decided effect of improved business conditions upon the earnings of American railroads represents one of the most important economic phases of the year. In this respect the showing has been so excellent as to exceed the most sanguine hopes, and counterbalances in large measure the unfavorable earnings reports in previous issues of the YEAR BOOK. The *Commercial and Financial Chronicle's* classified compilation of gross and net earnings of 249,249 miles of road shows that gross earnings for the six months ending June 30, 1916, exceeded those for the corresponding months in 1915 by no less than $328,012,578, the total rising from $1,403,448,334 to $1,731,460,912. Expenses, it is true, increased by the large amount of $161,861,191; yet net earnings reached the very satisfactory total of $559,376,894, against $393,225,507 during the first six months of 1915. The gain in net earnings of $161,861,191 represents the remarkable increase of 42.26 per cent. The detailed tabulation shows that the remarkable improvement not only continued as to both gross and net earnings through all the six months, but was well distributed over all sections of the country.

Babson's statement for 10 leading railway systems, representing every section of the country, shows gross earnings for the first seven months of 1916 to be 20 per cent. larger than for the corresponding months of 1915. For the last 12 months (ending July),

NET SURPLUS OF IDLE CARS

1914		1915		1916	
Jan. 1	188,850	Feb. 1[2]	279,411	Jan. 1	46,955
" 15	214,889	Mar. 1	321,747	Feb. 1	21,485
Feb. 1	209,678	April 1	327,084	Mar. 1	*n* 20,551
" 14	197,052	May 1	291,303	April 1	3,650
Mar. 1	153,907	June 1	299,928	May 1	33,361
" 15	124,865	July 1	275,636	June 1	57,693
April 1	139,512	Aug. 1	265,364	July 1	52,234
" 15	212,869	Sept. 1	185,009	Aug. 1	9,762
May 1	228,879	Oct. 1	78,299	Sept. 1	*n* 19,873
" 15	238,642	Nov. 1	26,239	Oct. 1	*n* 60,697
" 31	241,802	Dec. 1	38,199	Nov. 1	*n* 108,010
June 15	232,334			Dec. 1	*n* 107,778
July 1	219,540			Jan. 1, 1917	*n* 59,892
" 15	226,541				
Aug. 1	196,665				
" 15	172,145				
Sept. 1	163,326				
" 15	136,049				
Oct. 1	131,027				
" 15	151,982				
Nov. 1[1]	170,096				

n = net shortage. [1] Publication discontinued.
[2] Publication resumed, but monthly instead of fortnightly as formerly.

according to his statement, these earnings exceeded those of the preceding year by over 16 per cent. For the same two periods net earnings show increases of approximately 35 and 26 per cent. The present immense volume of traffic is indicated also by the existing shortage in cars. Instead of an average net surplus of 217,186 cars as reported by the American Railway Association for the year 1915 (idle cars reached the large total of 327,084 on April 1, 1915), the net surplus for 1916 to Oct. 1 averages only 12,368 cars, while on that date an actual net shortage of nearly 61,000 cars was reported. This shortage, according to press reports, increased to over 108,000 on Nov. 1. According to the *Commercial and Financial Chronicle's* comprehensive review of the railroad situation for the year:

> The year 1916 will always remain memorable for the magnificent way in which the great transportation systems of the United States were able to enlarge both their gross and their net income. The year stands unique for the imposing nature of the gain in gross and net alike. In this these transportation agencies, of course, simply reflect the wonderful expansion in trade and industry generally as the result of the demands upon the United States arising out of the gigantic conflict being waged between the leading countries of Europe. Prior to the present expansion in revenues, which had its inception about September or October last year, the railroad industry had for many years been languishing. Indeed, it was in a bad way, as cost of operations was rising and traffic and revenues failed to expand in a commensurate way. But under the stimulus to industry afforded by the present world war, they have now retrieved the past and at one bound regained all they had previously lost, and, advancing to new heights, are now surpassing by far the best records of the past.

Later reports, pertaining to the month of October, indicate less favorable results than those noted above. In part this is due to the fact that comparison is made with larger totals than was previously the case. The season's crop shortage, however, is also beginning to assert itself as an unfavorable factor. Owing to the serious wheat-crop failure in the Northwest, northwestern railroads are experiencing a considerably reduced tonnage and are therefore already reporting smaller gross and net earnings. Elsewhere the gains are still general but on a greatly reduced scale.

BANK CLEARINGS

The bank-clearings barometer of business conditions furnishes new high records both for New York City and for outside cities, and gives further proof of the extraordinary prosperity prevailing throughout the country. For the month of October the *Commercial and Financial Chronicle's* compilation for 162 cities shows total clearings of $25,612,566,000,

BANK CLEARINGS

	Bank Clearings Outside of New York		Total Bank Clearings	
	1915	1916	1915	1916
January	$6,195,741,000	$7,743,293,000	$13,483,434,000	$20,070,095,000
February	5,430,346,000	7,129,512,000	11,912,183,000	18,236,250,000
March	6,283,286,000	8,131,801,000	13,848,400,000	20,679,676,000
April	6,201,419,000	7,692,625,000	15,013,084,000	19,315,242,000
May	5,991,630,000	8,096,352,000	14,626,776,000	20,657,280,000
June	6,096,718,000	8,044,195,000	14,122,200,000	20,597,707,000
July	6,233,988,000	7,928,168,000	14,929,402,000	19,366,911,000
August	5,733,108,000	7,984,509,000	14,270,451,000	19,751,826,000
September	6,135,362,000	8,406,660,000	15,759,725,000	22,762,602,000
October	7,407,331,000	9,902,192,000	20,146,990,000	25,613,387,000
November	7,553,091,000	10,051,198,000	19,382,511,000	26,704,572,000
December	7,971,642,000	10,259,255,000	20,302,782,000	27,194,862,000

against $20,152,206,000 in 1915, an increase of 27.1 per cent. Compared with 1914, the increase reaches 118.2 per cent. For the first ten months of the year clearings aggregated $207,050,670,000, against the 1915 high record for the same months of $148,122,502,000. Thus far, therefore, the year 1916 presents an increase of 39.8 per cent. over 1915, while compared with 1914, the gain amounts to 57.4 per cent.

The foregoing gain, it should be noted, is well distributed through the country and is not confined mainly to New York City, as is sometimes the case. Exclusive of New York City, clearings for October total $9,901,000,000, a gain of 33.6 per cent. over the corresponding month of 1915, and of 61.6 per cent. over 1914. Gains are particularly large at such important and widely distributed centers as Chicago (increase over October of 1915, 32.5 per cent.), Philadelphia (38.9 per cent), Wheeling (51.2 per cent.), Fall River (45.4 per cent.), Cleveland (70.6 per cent.), Detroit (51.5 per cent.), Milwaukee (43 per cent.), Columbus (51.1 per cent.), San Francisco (36.3 per cent.), Seattle (52.2 per cent.), Salt Lake City (62.6 per cent.), Kansas City (27.7 per cent.), Denver (32.9 per cent.), St. Louis (42.1 per cent.), New Orleans (78.1 per cent.), Richmond (88.1 per cent.), Atlanta (55.2 per cent.), and Memphis (54.7 per cent.).

For the first ten months of the year, clearings exclusive of New York City total $81,059,000,000, a gain of 31.3 per cent. over the corresponding months in 1915 and of 34.1 per cent. over 1914. While bank clearings, exclusive of New York, probably constitute the best single barometer of general business conditions, it is only fair to note that such clearings are materially affected by rising commodity prices. Hence the foregoing increase must be viewed with this factor in mind. The later discussion of index numbers (see *infra*) will serve to show that the unprecedented rise in the price level of practically all commodities during the last two years has greatly increased the volume of checks cleared.

At New York City the exhibit of clearings presents a phenomenal showing. For October such clearings amount to $15,711,000,000, or 23.3 per cent. in excess of the October record of 1915, and 180.4 per cent. in excess of the same month in 1914. For the ten-month period clearings aggregate $125,991,000,000, or one and a half times the total clearings of all the other cities used in the *Chronicle's* compilation. This total represents a gain of 45.8 per cent. over the same period in 1915 and 77.2 per cent. over 1914. These large gains are traceable, in large part, to special circumstances. In the first place, operations on the New York Stock Exchange, as will be shown later, have been unusually heavy, and such operations, especially since stocks are selling at top prices, greatly augment bank clearings. Moreover, during 1914 the Stock Exchange, as well as other security markets in New York City, suspended operations for practically four months. Again, cotton, wheat and other commodities dealt in on the city's produce exchanges have increased enormously in price,

thus causing exchange operations to augment bank clearings to a considerable extent. Lastly, owing to the war, New York's importance as an export, import and banking center has tremendously increased, and an increased volume of business at greatly increased prices has been responsible for a large expansion in bank clearings.

THE SECURITY MARKET

Volume of Stock Transactions.—The most noticeable feature connected with the stock market during 1916 has been the enormous volume of transactions, particularly in the class of so-called "war stocks." In this respect nearly all of the year shows a continuation of the speculative craze which became so pronounced during the last half of 1915 (*A. Y. B.*, 1915, p. 336). For the first ten months of the year, shares traded on the New York Stock Exchange totaled 167,023,459, a noteworthy figure when compared with 141,812,201 for the same period in 1915, 45,990,575 in 1914, and 72,553,020 in 1913. In fact, we must go back to the year 1909 to find a larger total, namely, 178,302,309 shares.

With the exception of July, each month thus far has exceeded the 12-million share mark, and the tendency has been for the volume of sales to become increasingly larger. During September and October sales aggregated the huge totals of 29,992,582 and 28,161,277 shares. For October, the last month for which complete data are available at present writing, operations exceeded those for the same month in any year since 1904, and in most instances by a large margin. When viewed in connection with the prevailing high price level, the year's record of stock-exchange operations gives unmistakable evidence of one of the most violent stock-market booms in American history. It is also noteworthy, as indicating the direction of speculative activity, that many stocks which formerly played only a relatively minor part in the volume of transactions on the New York Stock Exchange have suddenly become very prominent. One may point to a recent instance, for example, when for an entire week the sales of 11 stocks, American Smelting & Refining, Anaconda, Baldwin Locomotive, Central Leather, Crucible Steel, Inspiration Copper, International Mercantile Marine common, International Mercantile Marine preferred, International Nickel, Kennecott Copper and Maxwell Motors, represented over one-third of the total volume of sales on the New York Stock Exchange.

SECURITY MARKET TRANSACTIONS AND PRICES
(New York Stock Exchange)

	Total Transactions				Average Security Prices			
	Shares of Stock		Bond Sales		10 Leading Stocks		10 Leading Bonds	
	1915	1916	1915	1916	1915	1916	1915	1916
January	5,076,210	15,956,944	$57,110,500	$118,024,500	133.0	143.3	89.2	91.8
February	4,383,449	12,126,205	43,842,500	85,355,000	131.8	138.3	89.0	91.8
March	7,862,308	15,197,585	63,124,500	81,638,000	131.6	138.0	88.7	91.6
April	21,022,930	12,523,507	110,359,500	79,384,250	136.8	136.6	89.8	91.4
May	12,581,040	16,527,576	64,284,200	98,569,000	133.0	138.6	89.2	91.5
June	11,004,042	12,823,833	57,957,000	84,786,500	132.4	140.5	88.7	92.3
July	14,371,633	9,187,868	55,535,500	67,823,500	127.8	139.7	87.5	92.0
August	20,432,350	14,626,082	72,253,000	84,934,000	131.6	139.2	87.2	91.9
September	18,399,286	29,992,582	80,741,000	97,145,500	133.1	140.6	86.6	91.8
October	26,604,702	28,161,277	104,122,500	133,970,500	141.5	143.9	88.2	93.4
November	17,634,270	34,552,860	130,088,500	122,426,000	145.0	142.0	91.2	93.9
December	13,698,732	31,735,674	120,517,000	95,795,000	142.7	137.5	91.8	93.8
Total, 1910	164,150,061							
1911	127,207,258							
1912	131,128,415							
1913	83,470,693							
1914	47,900,568							
1915	173,145,203							
1916	233,311,993							

RANGE OF STOCK PRICES DURING 1915 AND 1916
(New York Stock Exchange Quotations)

	1915			1916		
	High	Low	End Oct.	High	Low	End Oct.
American Car & Foundry	98	40	97⅛	78½	52	67⅞
American Cotton Oil	64	39	62½	58½	48½	57
American Locomotive	74¾	19	70½	98½	58	83⅛
American Smelting & Refining	95⅝	56	93⅜	122⅜	88⅛	112⅝
American Sugar	114⅞	99½	113½	125⅝	104	121½
American Telephone & Telegraph	126	116	124½	134½	123⅜	133
Atlantic Coast Line	115	98	115	126	106½	121½
Baltimore and Ohio	94⅞	63¾	94⅜	96	81½	88⅛
Brooklyn Rapid Transit	93	83½	87⅞	88⅞	81	85½
Canadian Pacific	185½	138	183½	183¾	162½	173¾
Chesapeake & Ohio	62⅜	35⅝	62½	71	58	69⅛
Chicago, Milwaukee & St. Paul	98½	77⅜	94½	102½	89	95
Chicago & Northwestern	132	118⅛	131⅛	134½	123	129
Erie	44⅛	19⅜	42⅜	43⅜	32	39½
Great Northern, pfd	125½	112¾	125½	127½	115	118½
Illinois Central	113	99	110	109¾	99¾	108⅛
Lehigh Valley R. R	156	74½	80⅜	87½	74½	84⅜
Missouri Pacific	18½	1⅜	5½	22	3½	9⅞
New York Central	103⅜	81½	103	114½	100½	108⅜
Northern Pacific	115½	99⅛	115½	118⅞	108	112
Pennsylvania R. R	118	57⅞	60¼	60	55	58¾
Reading	163⅜	77⅞	83	115½	75½	110⅛
Southern Pacific	102	81⅛	101⅛	104½	94½	100⅜
Southern Ry	25⅞	12½	25½	36½	18	29
Union Pacific	138½	115½	138½	153⅜	129¼	151⅜
United States Steel	88¼	38	88	129¾	79¼	119¼

Stock Prices.—While operations in the security market were conducted during the year on an extremely large scale, it is important to bear in mind that this activity was not accompanied by any general decided increase in prices. The increase had occurred during 1915. Since the essential function of organized exchange markets, aside from furnishing a convenient market place, is to discount future business conditions, it is only natural that stock-market prices should have discounted in 1915 the good business conditions of today. Referring to the table of representative stocks used in previous issues of the YEAR BOOK, it appears that the average price of the stocks enumerated stood at 91.8 at the end of October, as compared with 89 at the same time in 1915, thus showing only a very moderate increase for the year, whereas during the preceding year the increase in the average price exceeded 27 per cent. Roger W. Babson's "Weekly Barometer Letter" gives the average price of 20 representative railroad stocks as 110.0 at the middle of November, as compared with 106.53 at the same time in 1915, 87 in December, 1914, and 131.5 in August, 1909. As regards 12 representative industrials the average price at the middle of November, 1916, is given as 163.66, compared with 121.15 at the same time in 1915, 73.4 in December, 1914, and 97.7 in August, 1909.

In analyzing stock prices during the last two years it is important to distinguish between the shares of industrials and railroads, the former having advanced much more than the latter. Yet a use of averages will show that as regards both classes the highest prices were reached in 1915, and that present prosperity was successfully discounted by the market by about one year. Thus, taking 47 leading industrials listed on the New York Stock Exchange, representative of all important types of activity, it appears that on July 30, 1914 (closing prices), one share in each of these corporations could have been purchased at an aggregate cost of $2,786. Using the highest prices attained during 1915, these same shares would have brought a total of $6,045, thus showing an appreciation of 117 per cent. within about a year. By Sept. 8, 1916, however, the total price had dropped to $5,202, an appreciation of 87 per cent. over the price of July 30, 1914.

Using next 22 leading railway stocks as a basis, representing every section of the country, the average

price per share was 80¾ on July 30, 1914; the highest price during 1915 was 95⅛; the highest price during 1916 was 96½; while on Sept. 8, 1916, the price stood at 89¾. In other words, the highest average price for these representative railway stocks since the beginning of the war shows an appreciation of only 19.5 per cent. over the price level of July 30, 1914, while by Sept. 8, 1916, this appreciation was reduced to only 11-.14 per cent. Public-service corporation stocks have shown a similar tendency. Using 10 leading and representative issues listed on the New York and Philadelphia exchanges, the average price per share was 68¾ on July 30, 1914; the highest price during 1915 was 81⅜; the highest price during 1916 was 83½; while on Sept. 8, 1916, the price was 80¼. The highest price level, as compared with the price on July 30, 1914, represents an appreciation of only slightly over 23 per cent., while by Sept. 8, 1916, this appreciation had been reduced to 16.73 per cent.

The surprising thing is not that prices on the average did not seek higher levels during 1916 but that they maintained their price level as well as they did, in spite of such adverse factors as unsettled labor conditions, rapidly rising commodity prices, a crop failure in the Northwest, together with heavy losses in corn and cotton, and the destructive effects of the great war itself. Just as war conditions have shaped the course of the stock market during the past two years, so it is now the consensus of opinion that the same influences will govern it in the immediate future. The general impression is that its course manifestly depends upon the duration of the war. Many stocks are regarded as certainly too high if the war should stop within the next few months; but should the war and present orders and profits continue for a year or two more, it is argued by many that present prices would be justified. Judging from the present volume of sales and the comparative firmness of prices, Wall Street is evidently proceeding on the theory that peace is still remote and that the war will continue for another year or two at least.

The foregoing statement, in view of the great advance in industrial stocks in 1915, calls attention to the mediocre market advance of representative railway stocks. In view of the remarkable earnings of American railroads during 1916, it seems difficult to explain the very modest advance in the price of railway shares. Manifestly, the significance of present earnings is largely lost when we reflect that the comparison is with very unfavorable returns for 1915 and most of the years immediately preceding. Heavy foreign liquidation of American railway stocks, no doubt, has exerted its influence also. The stock market is concerned chiefly with the future and the discounting of an unfavorable railroad situation in the future has probably been more responsible than any other factor for the failure of railway stocks to keep pace with industrials in their violent upward market movement. Greatly increased traffic necessarily means increased equipment and enlarged terminals. But rolling stock, other equipment and buildings now cost more than ever before. Moreover, the labor problem has loomed threateningly over the railroads for over a year and is likely soon to be even more serious (see also XVI, *Labor*). Skilled labor already has aggressively pushed its demands and the claims of unskilled labor will probably soon follow. In all probability the market also regards the huge traffic prevailing just now, traceable very largely to the war, as purely temporary. It is probably felt that with the return of normal peace conditions the railroad troubles of recent years will again prevail. It should not be overlooked that the prices of what the railroads sell is regulated by law, while the prices of what they must buy, terminals, equipment and labor, have been steadily rising and are not thus regulated. (See also XX, *Railroads.*)

Prices of War Stocks.—The YEAR BOOK for 1915 called attention (p. 337) to the extraordinary rise in the price level of the shares of (1) those corporations engaged in the manufacture of ammunition, railroad equipment and army supplies; (2) those receiving orders for food and cloth-

WAR STOCKS

	July 30, 1914	High, 1915	High Since Jan. 1, 1916	Sept. 8, 1916	Nov. 3, 1916	Dec. 29, 1916
Allis-Chalmers	7¼	49½	38	23¾	28½	27
American Can	22⅞	68½	68½	64⅝	64⅝	46½
American Car & Foundry	46¼	98	78½	63⅞	71⅞	64½
American Locomotive	23	74¾	98¼	78¼	92½	76⅝
American Steel Foundry	27½	74½	73	56	64½	60
American Woolen Co	12	56	58⅞	46½	53	43⅞
American Zinc, Lead & Smelt.	12¾	71½	97⅞	38	55½	37½
Baldwin Locomotive	42	154½	118⅝	82½	87	57½
Bethlehem Steel	33¾	600	700	492	678	525
Crucible Steel	14½	109⅞	99½	83⅞	94	61¾
Distillers' Securities	12½	50½	54½	45½	46½	28
Electric Storage Battery	47	60	72¼	66½	70½	67
General Chemical	171	360	350	310	330	310
General Electric	140¾	185½	187¼	171½	183¾	167
General Motors	78	558	50	580	814	.....
International Mercantile Marine	2¼	20½	50⅞	49⅝	41⅝	26
Lackawanna Steel	30	94¾	107	80½	89⅞	82
New York Air Brake	60	164¾	186	138	158½	143
National Lead	41¾	70¾	74⅝	64½	69	58
Pressed Steel Car	38½	78¼	88¼	55	75⅛	74
Studebaker	28	195	167	124½	129¾	103¾
Tennessee Copper	29	70	66½	26⅞	23⅛	163⅜
United States Industrial Alcohol	20	131¾	170½	114	143¼	110¾
United States Steel, Common	55½	89½	129¾	100¼	120⅞	106¼
Virginia-Carolina Chem. Co.	24⅛	52	51	42⅝	46⅝	43
Westinghouse Elec. & Mfg. Co.	73⅜	74⅞	71⅝	61⅜	67½	54⅝
Willys-Overland	85	268	325	46¼	42¾	35⅛
Total	1,178	3,882	4,433	3,111	3,737	2,425

ing, enormous quantities of which are needed by the belligerent countries to equip their armies or to replace the decreased production occasioned by the withdrawal of numerous workers from their normal occupations; (3) iron and steel companies called upon to furnish materials to meet the domestic requirements for raw materials, machinery and additional working equipment along many lines, in order to fulfill foreign orders; (4) automobile manufacturing companies with large contracts on hand for foreign delivery; and (5) steamship companies benefitting from greatly increased freight rates. During 1916 these groups of stocks still present the picture of enormous war profits and an unprecedented appetite for stocks at exceedingly high prices. In the main, the volume of transactions in these groups of stocks has been considerably greater in 1916 than during 1915, and in many instances new high levels were reached. This situation is all the more noteworthy in view of the fact that it has occurred in the face of the heaviest foreign liquidation to which the American market has ever been subjected. Nearly every week of the year has had its sensation in the industrial list, and every reader is familiar with the rise of General Motors from 78 to 814 and of United States Steel common from 48 in 1915 to 129 in November, 1916, despite the fact that during 1915 the amount of United States steel stock owned in Europe is reported to have decreased 41.6 per cent.

The huge volume of transactions and sensational upward movements in individual stocks, however, should not cause one to overlook the important fact that the highest prices in war stocks prevailed in 1915, or early in 1916, and that the present price level is so much lower as to warrant the belief that the stock market practically discounted the effects of war profits within the first year of hostilities. The relation of present prices to those of 1915 is indicated by the accompanying table of 27 leading corporations which have figured largely in the newspaper accounts of war profits. Summarizing the table it appears that on July 30,

1914, one share in each of these corporations could have been purchased at a total cost of $1,178. At the highest prices of 1915 these same shares represented an aggregate price of $3,882, an appreciation of 229 per cent. By Sept. 8, 1916, the price had declined to $3,111, an appreciation of 164 per cent., as compared with the price of July 30, 1914. Moreover, while these stocks increased considerably following Sept. 8, they suffered a very severe decline in the latter part of December in connection with the widely heralded peace rumors. In fact, the volume of sales and the accompanying decline in prices almost reached panic proportions. On Dec. 29 the prices of 26 of the stocks referred to in the table (excluding General Motors, for which no sale is recorded) aggregated only $2,425, as compared with corresponding aggregations of $2,923 on Nov. 3, 1916; $2,531 on Sept. 8, 1916; $3,548 for the high of 1916; $3,324 for the high of 1915, and $1,100 on July 30, 1914. The quotations at the close of the year thus show an average appreciation of only 120 per cent. over the prices prevailing on July 30, 1914, and a decline of nearly 27 per cent. as compared with the high price in 1915.

Even greater has been the rise in the price level of leading "ordnance stocks." Unfortunately, averages cannot well be obtained here, partly because few of these stocks were quoted on July 30, 1914, and partly because quotations have been changed so frequently by increasing the stock issues or by converting old securities into new. The combined price of nine of these stocks (comparing the quotations of July 30, 1914, with those of Dec. 31, 1915) shows an appreciation of 311 per cent. Copper stocks likewise, owing to large war orders and an increase in the price of the metal at New York within the year from 17.75 cents to 28.38 cents, have shown large advances. Babson's average price for 20 active copper stocks stood at 54.1 for September, 1916, as compared with the average of 31.9 for December, 1914.

Bond Sales.—During the first ten months of the year bond sales on the New York Stock Exchange aggregated $931,630,950, as compared with $710,489,200 in 1915, $425,086,100 in 1914, and $424,280,020 in 1913. These sales for 1916 seem large, but the figures are apt to be misleading. Owing to the closing of the New York Exchange following July 30, 1914, there were practically no bond sales for five months of that year, and during 1916 trading in Anglo-French, American foreign, British and Canadian issues constituted approximately one-third of the total. As in the case with stocks, the price level of standard bond issues changed but slightly during 1916. Babson's average price of 10 leading and representative bonds gives 93.7 as the average price for November, 1916, and 91.2 as the average price for November, 1915. The price of 93.7 for November, 1916, compares with the price of 90.7 for November, 1913, 96.4 for 1912, 98.0 for 1911, 98.2 for 1910, and 100.1 for 1909.

That bonds, with their fixed interest rate, should not appreciate materially is logical enough. We need only consider the present temptation to investors and speculators to divert the flow of capital to stock issues which permit of participation in the large profits that are now being made or are expected in the future. The rapidly increasing cost of living, the rising tendency of long-term money rates, the general feeling that interest rates, as a consequence of the war, will be materially higher for years to come, and the flotation of large foreign war issues in this country on a 5½ and 6 per cent. basis with the prospect of further issues, also constitute in their combined effect a powerful deterrent to any upward movement in bond issues yielding only a moderate rate of interest and having a number of years to run before maturity. The resale to us of large blocks of American bonds held abroad and the temptation to many to invest in foreign securities, owing to their low price and the favorable rates of exchange, are additional factors that now weigh very heavily upon the price level of existing American bond issues.

New Securities Listed.—Listings of securities on the New York Stock Exchange during 1916 occurred on a

very much larger scale than during any of the preceding three years. For the first nine months of the year such listings aggregated $1,308,300,975, or approximately twice the listings for the corresponding months of 1915 ($666,482,950) and 1913 ($633,126,315), and nearly one and three-fourths times those of 1914. In fact, listings during the first nine months of 1916 exceeded the listings during all of 1915 by over 11 per cent., during 1914 by nearly 36 per cent., and during 1913 by over 35 per cent. At this rate of listings the total for the year bids fair to equal or exceed that of any year since 1909, when listings reached the unusually high figure of $2,439,656,870.

The poor showing of 1915 is traceable chiefly to the collapse of credit for several months following the outbreak of the war and the resulting disturbed business operations. Thus far every month of 1916, except January, presented a total considerably in excess of the corresponding month of last year. Notice should be taken of the fact, however, that the large total of 1916 includes the $500,000,000 of Anglo-French bonds. Excluding this large foreign issue, 1916 listings for the first nine months of the year exceed those for the same months of the years 1915 and 1914 by only 21 per cent. and 8 per cent., respectively.

LISTINGS OF NEW SECURITIES

	1915	1916
January	$84,282,800	$29,613,700
February	57,489,600	552,614,700[2]
March	160,556,400	148,988,775
April	33,943,550	73,720,400
May	28,409,000	34,819,000
June	70,316,800	173,258,600
July	15,717,000	59,767,100
August	123,210,000	121,690,900
September	92,557,800	143,827,800
October	95,856,250	89,531,450
November	119,398,000	161,234,150
December	290,341,120[1]	432,668,500

Total, 1909	$2,439,656,870
1910	1,678,147,570
1911	1,329,616,345
1912	1,786,986,170
1913	968,738,315
1914	964,157,200
1915	1,172,078,320
1916	1,991,735,075

[1] Including $138,000,000 Wabash Ry. Stock.
[2] Including $500,000,000 Anglo-French Bonds.

INCORPORATIONS

Intense activity on the stock exchanges, accompanied by rapidly rising prices and an abundance of newspaper comment on large profits and the placing of huge orders, almost invariably prepares the public for participation in new ventures and thus furnishes the opportunity of the promoter. Probably never before were rumors of immense orders and prophecies of unheard-of profits so persistently paraded before the reading public as during 1916. It is not at all surprising, therefore, that the last four months of 1915 and all of 1916 up to the time of writing, furnish abundant evidence of the avidity with which the public absorbed new security issues.

New incorporations, with an authorized capital of $1,000,000 or over in the eastern states, are reported as aggregating $1,967,300,800 during the first nine months of 1916, as compared with only $892,372,100 and $672,360,000 for the corresponding months of 1915 and 1914. For the 12 months, October, 1915, to September, 1916, inclusive, new incorporations aggregated the extraordinary total of $2,925,770,000, or almost three times the amount reported for the preceding 12 months. New securities issued by existing corporations totaled $1,712,826,300 during the first nine months of 1916 and $2,174,617,000 for the 12 months from October, 1915, to September, 1916, inclusive. These figures are, respectively, 2.20 and 2.13 times as large as those for the first nine months of 1915, and for the 12 months from October, 1914, to September, 1915. These totals are all the more significant when we reflect that since the opening of hostilities abroad we have loaned over $1,500,000,000 to foreign borrowers and have reduced our indebtedness abroad by about $1,800,000,000 through the repurchase of American securities held in the belligerent countries. The flotation of motor, munition, steel, chemical and engineering stocks, particularly in the lines profiting from war orders, represents a large part of the total. It may be added that an examination of the most active of this type of new issues during the year

INCORPORATIONS OF $1,000,000 AND OVER

	1916	1915	1914	1913
January	$270,995,000	$51,150,000	$120,050,000	$332,450,000
February	365,995,300	53,950,000	51,575,000	191,500,000
March	194,750,000	70,050,000	57,700,000	166,030,000
April	166,650,000	32,200,000	136,185,000	198,718,000
May	209,735,000	78,950,000	62,700,000	172,200,000
June	264,350,000	181,247,100	70,050,000	79,550,000
July	217,662,500	71,100,000	68,700,000	83,650,000
August	113,472,000	67,100,000	50,600,000	63,500,000
September	164,700,000	286,625,000	54,800,000	42,750,000
October	303,768,700	208,695,000	35,487,500	70,856,300
November	206,407,800	190,075,000	81,650,000	77,800,000
December	230,850,000	135,125,000	105,450,000	55,250,000
Total	$2,708,326,300	$1,426,267,100	$894,947,500	$1,534,254,300

shows that most of them reached their highest price level during the period of flotation and that in the great majority of cases present price levels are much below the quotations prevailing at or shortly after the period of flotation. The aggregate underwriting price of 15 representative and important stocks (of the type indicated and floated during the year) was $882. The aggregate "highest price" of these same stocks (attained in 10 out of 15 instances during the month of flotation) was $1,259, or an increase of 42.5 per cent. over the underwriting price. In August the price was down to $777, a decline of over 38 per cent., as compared with the highest price, and of nearly 12 per cent. as compared with even the underwriting price.

THE MONEY MARKET

Money-market conditions during all of 1916 were the opposite of what might have been expected during a period of great speculation and business prosperity. In fact the phenomenon of present low money rates is contrary to all former precedents. It is an axiom of the Street that low money rates encourage higher stock prices, and *vice versa*, that great activity in the stock market and in business at inflated prices causes money stringency and higher interest rates. At the time of writing (middle of November), however, after nearly two years of stock market boom and one year of excellent business, we have the spectacle of brokerage houses getting all the call-loan credit they want at 2¼ to 3¾ per cent., while prime commercial paper can be discounted at 3¾ per cent. Throughout the year the monthly average for demand loans in New York has never exceeded 3⅛ per cent., while during February the average was as low as 1¾ per cent. Time loans never averaged higher than 4⅛ per cent. (July), and during most of the other months ranged between 3 and 3¾ per cent. Neither crop-moving demands, record-breaking business at high prices, nor several months of million-share days on the New York Stock Exchange seem to have had the slightest effect on money rates. During 1915 low money rates were one of the primary causes back of the violent and long sustained rise in the stock market. Now it may be said that there can be no doubt that present abundance of credit at unusually low rates is largely responsible for maintaining during 1916 the high prices reached in the preceding year.

The unusual situation of abundant credit at low rates is chiefly the result of two principal factors, namely, Great Britain's policy of sending gold to this country and the new Federal Reserve Act. Great Britain's wishes are manifestly to liquidate at highest prices such American securities as she may hold and wish to sell to us, and to effect loans in the United States at the lowest possible rates of interest. With easy money rates and firm stock-market prices, large loans certainly can be distributed in this country to better advantage. Great Britain also has entered upon a policy of mobilizing American securities with a view to using them in this country as pledges for loans. Her advantage in carrying out this

MONEY MARKET CONDITIONS

	Loans, Deposits and Reserves of New York Clearing House Banks					
	Loans (000 omitted)		Deposits (000 omitted)		Surplus Reserves (000 omitted)	
	1915	1916	1915	1916	1915	1916
January	$1,524,087	$2,264,788	$1,529,079	$2,469,470	$121,283,072	$143,435,675
February	1,583,166	2,283,534	1,625,374	2,488,363	135,011,353	143,980,405
March	1,635,846	2,292,207	1,685,190	2,468,672	131,948,273	123,044,232
April	1,648,234	2,313,325	1,733,251	2,460,541	156,375,784	99,444,208
May	1,652,084	2,285,689	1,744,686	2,394,899	168,150,712	81,061,405
June	1,698,420	2,244,948	1,820,446	2,333,490	185,957,532	80,129,680
July	1,780,787	2,161,749	1,886,125	2,230,040	159,697,020	84,150,955
August	1,841,944	2,175,949	1,971,927	2,267,685	177,793,428	107,324,348
September	1,917,807	2,267,367	2,091,568	2,352,761	197,750,086	82,541,653
October	2,085,174	2,295,565	2,353,971	2,381,409	179,155,250	81,359,810
November	2,203,253	2,353,621	2,408,797	2,446,935	168,161,815	79,651,654
December	2,226,078	2,287,933	2,422,994	2,350,686	155,555,574	76,278,725

	Money Rates						Gold Movements (Excess of Imports)	
	New York Monthly Average				Average Bank Rates, England, France and Germany			
	1915		1916					
	Time	Call	Time	Call	1915	1916	1915	1916
January	4	2½	3⅛	1⅞	5	5	$6,204,889	$4,794,715
February	3½	2	3	1½	5	5	11,672,613	+7,668,661
March	3½	1½	3⅛	2	5	5	24,696,576	+997,915
April	3⅜	2½	3⅛	2½	5	5	15,389,322	+5,381,211
May	3⅜	2	3⅜	2½	5	5	29,858,757	15,403,346
June	3⅜	1⅝	3⅜	2⅝	5	5	49,519,752	114,422,716
July	3⅜	1⅜	4⅛	3⅛	5	5½	15,071,203	52,712,630
August	3⅜	1½	3⅜	2⅜	5	5½	60,512,763	29,458,587
September	3⅜	2	3⅜	2⅝	5	5½	40,934,021	85,713,106
October	3½	1½	3⅜	2⅝	5	5½	76,730,559	90,455,191
November	3½	1⅝	3½	2⅝	5	5½	57,320,387	20,637,841
December	3½	1¾	4	4½	5	..	33,523,392	.....

+ = excess of exports.

policy lies in keeping the price of her collateral as high as possible. Moreover, high prices prove advantageous to Great Britain and her allies for the actual sale of American holdings of securities. In fact, such sales since the beginning of the war have aggregated probably between one and one-half and two billions of dollars and have been an important factor in keeping down the price of many leading American issues.

Yet in all probability these sales could have been effected only at lower and declining prices had it not been for the strong upward movement in other quarters of the market. In other words, securities act more or less in sympathy with one another and rising or firm prices in one quarter of the market often make possible free liquidation at fairly steady prices in another. From every point of view, therefore, it is clear that Great Britain is vitally interested in the maintenance of relatively low interest rates in New York, as well as a high and firm security market. To accomplish these purposes Great Britain has found it advantageous to pay for a great share of her purchases here with gold. As a means to the end just indicated, between 700 and 800 millions of gold has come to the United States since the beginning of hostilities. (See also XIV, *Banking and Currency.*)

In addition to this factor mention should be made also of the Federal Reserve Act as another cause of abundant credit and low interest rates. The new banking law provides much greater credit facilities than the law it supplanted. An examination of the accompanying table will show that between Jan. 1, 1915, and October, 1916, loans of the New York Clearing House banks rose from $1,-

524,087,000 to $2,295,565,000, an increase of 50 per cent. Cash holdings of these banks during the same period increased from $286,533,000 to $334,047,000, or an increase of less than 18 per cent. Surplus reserves of these banks, although greatly increased by the new banking law, nevertheless declined during the 22 months under consideration from $121,283,072 to $81,359,810. It is well to bear in mind, however, that the surplus reserves of the New York Clearing House banks, so frequently characterized in the newspapers as "very comfortable," would have been entirely different, in fact would at various times during the year have shown a large deficit, under the old reserve requirements.

PRICES AND COST OF LIVING

During all of 1916 the consumer has seen a constant and material rise in the price of necessities. So rapid and general has been the upward movement, coming as it does on top of a material rise during the preceding 18 months, that the phenomenon has been the subject of endless comment in the news and financial press. The extent of the rise is brought home to all when we consider present prices of standard commodities fundamental to our business life: wheat selling in the neighborhood of $2.00 a bushel, corn at nearly $1.00 a bushel, cotton in the neighborhood of 20 cents a pound, soft coal at approximately $5.00 a ton, coke in the neighborhood of $7.50 a ton, and anthracite coal in New York at $13.00 a ton. For the month of October Bradstreet's index number averaged 12.0399, as compared with 11.5294 in July and 10.9163 in January, 1916, and with 9.1431 in January, 1915, 8.8857 in January, 1914, and 8.29 in January, 1908. For the first 10 months of 1916 Bradstreet's number averaged 11.5422, as compared with 9.7213 for the corresponding period in 1915, 9.0085 in 1914, and 7.98 in 1908. The average October figure of 1916 represents an increase of 22 per cent. over the average figure for 1915 (9.8531), of nearly 34 per cent. over the average for 1914 (8.9985), and nearly 50.5 per cent. over the average for 1908.

INDEX NUMBERS

Year	Bradstreet's	London *Economist*	Gibson's
1901	7.57	1948	44.5
1902	7.88	2003	53.5
1903	7.94	2197	49.0
1904	7.92	2136	48.3
1905	8.09	2342	47.3
1906	8.41	2361	49.8
1907	8.90	2508	50.9
1908	8.00	2223	54.2
1909	8.51	2231	59.2
1910	8.98	2407	59.3
1911	8.7129	2542	56.9
1912	9 1867	2699	62.6
1913	9.2115	2704	58.1
1914	8.9985	2643	60.8
1915	9.8531	3244	64.0
1916:			
January	10.9163	3634	65.6
February	11.1415	3840	68.2
March	11.3760	4008	69.5
April	11.7598	4013	71.3
May	11.7485	4190	72.3
June	11.6887	4319	70.8
July	11.5294	4213	71.9
August	11.4414	4204	76.1
September	11.7853	4372	78.4
October	12.0399	4423	82.2
November	12.7971	4596	87.1
December	13.6805	4779	85.1

The London *Economist's* number shows an even greater increase in English prices. For the month of October this number averaged 4423, as compared with 4213 in July and 3634 in January, 1916, and with 2800 in January, 1915, 2623 in January, 1914, and 2310 in January, 1908. For the first ten months of 1916 this number averaged 4122, as compared with 3206 for the corresponding period in 1915, 2622 in 1914, and 2228 in 1908. The October average figure of 1916 represents an increase of 36 per cent. over the average figure for 1915 (3244), of 67 per cent. over the average figure for 1914 (2643) and nearly 99 per cent. over the average figure for 1908 (2223). Gibson's index number, likewise, averaged 78.4 for September, 1916, as compared with 71.9 for July and 65.6 for January, 1916, and with 64.0 for 1915, 60.8 for 1914, and 54.2 for 1908. (See also XVI, *Labor.*)

Various causes have combined to bring about the phenomenal increase just indicated. In the first place attention should be called to the short crops in this country (see *Agriculture, supra*), combined with an unfavorable food situation in other leading countries as well as an unprecedented foreign demand. With the

possible exception of Russia, which is virtually isolated by the war, no leading grain-producing country seems to have had favorable crop returns in 1916. The international supply of meat and meat products is equally unfavorable, such countries as Argentina and Australia having experienced severe reverses in their cattle and sheep production. Moreover, the leading food-importing countries have made demands upon us during the year far in excess of their normal requirements, partly because of the war, and partly because the British and French grain crops turned out to be unusually small. As regards manufactured articles, the foreign demand, owing to the war, has been so unprecedented as virtually to exceed, along many lines, the fullest producing capacity of our industries. The belligerent nations, moreover, have been compelled to curtail their exports, and the suspension of competition in American markets from foreign sources also constitutes a factor tending to accelerate the rise in prices.

A considerable portion of the increase, however, must be attributed to inflation brought about by the credit situation. In the first place, the Federal Reserve Act has vastly enlarged the credit facilities of the banks, and, secondly, as already explained, between seven and eight hundreds of millions of gold have been sent to this country by the belligerent nations of Europe. The effect of these two factors upon the level of prices is generally admitted. Moreover, merchants and speculators have been obsessed so generally with the idea that prices are bound to go higher that they have purchased or contracted for much larger stocks of goods than ordinarily in anticipation of a large speculative gain over and above a regular trade profit. This movement, when so many participate in it, has hastened the rise in prices.

THE CONDUCT OF BUSINESS

Stock Exchange Regulations.—On April 26 the governing committee of the New York Stock Exchange adopted a resolution to the effect that under the resolution of Feb. 9, 1898, no member, or his firm, is permitted to use "'catch phrases' or to depart in any way from direct and simple methods of advertising." The resolution of 1898, it should be stated, requires all published advertisements of members to be of a strictly legitimate business character, and any departure from this rule is declared to be "an act detrimental to the interest and welfare of the Exchange." This attempt to ban "catch phrases" has been the subject of much discussion. In explaining the purpose of the resolution Winthrop Burr, chairman of the committee on business conduct of the Exchange, said:

> There is not the slightest thought among the governors of trying to restrict the advertising of Exchange members. On the contrary, we are in favor of publicity measures which assist the business of the members, provided that advertisements are worded in simple and direct language. It seems to me that a tempest has been stirred up in a teapot about the recent repetition of the rule regarding advertising. Only 16 firms of the 500 holding membership have been cautioned, and no complaint has been made to the governors from the larger body of active houses about the application of the rule.
>
> The governors object to the use of phrases which are irrelevant and are used merely to attract attention because they hold such advertising is undignified. It is not necessary. The members can get before the public the information they desire without resort to extraordinary sentences or phrases, or the use of heavy type, in extraordinary ways, and I cannot see why any misapprehension should have arisen over the ruling.

Discontinuance of the practice of closing transfer books on various occasions by corporations was also urged by the New York Exchange, and a recommendation was issued to that effect by the committee on stock list. Attention is called to the fact that the closing of books "is an unnecessary expedient" and that "many of the larger corporations long since abandoned this practice for the equally efficient and more satisfactory one of taking a record of stockholders on a fixed date." The old method of closing a company's books, it is asserted, often results in the tying up of large sums of money. Where the

laws of the state under which the company is incorporated do not require the closing of the books, this fact is called to the attention of the management; and where the company's by-laws do not permit the directors to make the change without a vote of the stockholders, an urgent request is made to have the matter taken up at the next meeting of stockholders. To quote the Exchange's letter of recommendation:

> In case of a serious collapse of the market, the inability to secure ready transfers must produce unfortunate situations. During panicky conditions, small buyers have always appeared, to purchase at the low prices for cash; this relief will be seriously impeded, because the dealers in small lots are prevented from splitting up the hundreds bought against such sales, and are obliged to receive and carry the hundreds so purchased, while unable to secure from companies the smaller lots sold.
>
> This is a matter which, as well, interests lenders of money—where transfers of stock are impeded, although money is most needed. Its circulation is interfered with—bankers are called upon to carry their customers for longer periods and for larger amounts than where deliveries are made day by day; some books are kept closed as much as 30 days.

To facilitate the work of clearing stocks, and obviate congestion, the Clearing House of the New York Stock Exchange created a "distributing department" which began operations on Jan. 21. In announcing the establishment of this department, S. F. Street, chairman of the committee on Clearing House, explained that under the new system Clearing House tickets will be sent to the distributing department, by all firms clearing at frequent intervals, and they will receive tickets going to them from others. Thus the delivery and receipt of all tickets for a firm of any size can be attended to by one person. Correction of errors on tickets, however, will be made between offices as heretofore. To facilitate the successful working of the new plan all members are in duty bound to report all their sales and purchases as promptly as possible at their respective offices so that opportunity for prompt comparison of transactions can be relied upon.

Mention must be made here also of the reorganization plan submitted by the board of representatives of the New York Curb Market Association. The plan, which was submitted in view of the growth of the Curb Market, contemplates the housing of the Association, which, it is believed, would make possible a better control of the market, thus making curb securities more acceptable as banking collateral; the establishment of a ticker service, which, it was felt, would enlarge the business of the market; and the establishment of two classes of membership, regular and associate, the first to be limited to 400 and composed of the present membership, and the latter to consist of individuals engaged in the banking or brokerage business but without floor or voting privileges. According to the announcement of the Board, the plan had for its primary purpose the "elimination of certain fundamental ills that cannot be stopped in a free-for-all market," and for the best interests of all concerned "to place the second largest security market in the United States on a more stable basis." Although 216 votes were cast in favor of the plan, with 20 against and 96 not voting, the Board decided, in view of the signed opposition of 51 New York Stock Exchange firms and other misunderstandings, not to declare the plan operative at this time. Instead, the special committee having charge of the matter took steps to confer with a committee representing the opposition, and issued a request to all members to express in detail their objections, suggestions or recommendations.

Regulation of Stock Quotations.—The Massachusetts Public Service Commission, as reported in the last issue (*A. Y. B.*, 1915, p. 344), ordered the Gold and Stock Telegraph Co., through its lessee, the Western Union Telegraph Co., "to remove the alleged discrimination against Calvin H. Foster, Boston correspondent of a member of the New York Stock Exchange, whose request for a ticker service had been refused because the application had not been approved by the Stock Exchange." Following this decision the Exchange, which has always taken the position that it has absolute control over its quotation service and should be allowed in the in-

terest of protection to the public to retain control over it, sought to have the Massachusetts Supreme Court overrule the Public Service Commission. The Supreme Court, however, upheld the Commission's order. Thereupon, on July 7, the Exchange, through its president, filed in the U. S. District Court at Boston a petition asking for an injunction to restrain the Western Union Telegraph Co. and the United Telegram Co. from furnishing stock-exchange quotations to Foster, who, it is alleged, intended to open a "bucket shop" in Boston, and who for that reason did not have his application for a quotation service approved. In its brief the Stock Exchange contends "that the Massachusetts Public Service Commission's order is void inasmuch as the ticker service is interstate commerce, over which the Commission has no control." The brief also contends that the Commission's order violates the Federal Constitution.

Blue-Sky Laws.—The YEAR BOOK for 1915 explained (p. 345) that blue-sky legislation, existing in some 19 states, fell under judicial condemnation in two leading states, Michigan and Iowa. In 1916 interest in such legislation centers on the outcome of various cases now before the U. S. Supreme Court rather than in the passage of new laws. Blue-sky bills were introduced in Kentucky, Maryland and Virginia. In the first two states the bills failed to pass, while in Virginia, on the suggestion of the Investment Bankers' Association, the main part of the so-called Bank Supervisors' Act was substituted for the original bill and adopted by the legislature.

In Michigan a second suit (following the one described in the last issue) was brought to test the legality of such legislation, and again the law was declared unconstitutional. Similar verdicts were handed down in South Dakota and Ohio. All three cases are now before the U. S. Supreme Court. The verdict of the highest court in this important matter is awaited with much interest by the financial community. The Investment Bankers' Association is taking an active interest in the case, and, according to the annual report of its general counsel, will appear "to contest the principle that the business of buying and selling securities can be made the subject of discretionary executive license and control."

Federal Legislation.—The Sixty-Fourth Congress enacted during its first session five important acts affecting the conduct of business: (1) an act creating the United States Shipping Board for the purpose of encouraging and developing the merchant marine and a naval auxiliary and for the regulation of shipping; (2) an act establishing a system of rural credits under the supervision of a Federal Farm Loan Board; (3) an act authorizing the Secretary of Agriculture to establish Government standards for grains; (4) an act providing for the licensing by the Secretary of Agriculture of warehouses for the storage of agricultural products and regulating the issuance of receipts therefor; and (5) an act regulating dealings in cotton futures, this and the two preceding measures being incorporated in the Agricultural Appropriation Act approved Aug. 11. It was necessary to discuss here only the Warehouse Act and the Cotton Futures Act, since other contributors to this issue treat in considerable detail the Shipping Act (see XX, *The Merchant Marine*), the Farm Loan Act (see XIV, *Banking and Currency;* and XVII, *Agriculture*), and the Grain Standards Act (see XVII, *Agriculture*, and *Agricultural Legislation*).

The United States Warehouse Act.—The United States Warehouse Act, constituting Part C of the Agricultural Appropriation Act, authorizes the Secretary of Agriculture to investigate the storage, warehousing, classifying according to grade or otherwise, weighing, and certification of grains, cotton, wool, tobacco, and flaxseed if the same are stored for interstate or foreign commerce; to issue licenses for the operation of warehouses under the terms of the Act; to inspect all warehouses licensed by him and to determine their suitable character for storage purposes; to classify such warehouses according to ownership, location, surroundings, capacity, conditions, and other qualities; and to prescribe the

duties of warehousemen licensed under the Act with respect to their care and responsibility for agricultural products stored therein. As a condition to the granting of a license the warehouseman must agree to comply with all the terms of the Act as well as all the rules and regulations which the Secretary of Agriculture is authorized to promulgate thereunder. Each license shall be issued for one year, and may be renewed from time to time by a written instrument, if all conditions are satisfactorily complied with. Adequate bond, other than personal security, must be furnished by the warehouseman to the United States to secure the faithful performance of obligations under this Act, or under the laws of the state in which he is operating, or under any contracts into which he may have entered with the depositors of agricultural products in his warehouse. A license may be issued to any person not a warehouseman to accept the custody of agricultural products and to store them in a warehouse owned, operated, or leased by any state, upon condition that such person agrees to comply with all the terms of the Act, as well as all rules and regulations prescribed thereunder. Such person shall issue receipts for products placed in his custody and must also furnish adequate security in the form of a bond as defined by the law. Briefly described, the following additional features of the bill deserve special notice:

(1) Every warehouseman operating under the Act must receive for storage, so far as capacity of his plant permits, any agricultural product of the kind customarily stored therein which is in suitable condition when offered, without making any discrimination between persons requesting warehouse facilities.

(2) Grain, flaxseed, or any other fungible agricultural product stored for interstate or foreign commerce in a warehouse licensed under the Act must be inspected and graded by a person duly licensed under the Grain Standard Act to grade the same.

(3) The product of each depositor must be kept separate from agricultural products of other depositors so as to permit at all times proper identification and redelivery of the product deposited. By agreement or custom, however, a warehouseman may be authorized to mingle fungible agricultural products with other products of the same kind and grade. In such cases he shall be severally liable to each depositor for the care and delivery of his share of such mass, to the same extent and under the same circumstances as if the agricultural products had been kept separate. Under no conditions, however, may fungible agricultural products of different grades be mixed.

(4) Every receipt issued for agricultural products stored in a licensed warehouse must embody within its written or printed terms a large number of facts and conditions enumerated in the law.

(5) The Secretary of Agriculture may from time to time establish and promulgate standards for agricultural products by which their quality or value may be judged or determined. Such standards as may be promulgated shall be known as the "official standards of the United States" for the agricultural product to which they relate.

(6) Every warehouseman operating under the Act must keep in a place of safety complete and correct records of all Agricultural products stored in his warehouse and withdrawn therefrom, of all warehouse receipts issued by him, and of all receipts returned to and cancelled by him. All such facts, together with others prescribed by the law, must be reported to the Secretary of Agriculture from time to time.

(7) The Secretary of Agriculture is authorized to cause examinations to be made of any agricultural product stored in any warehouse operating under the Act and to publish his findings; to suspend or revoke any license issued under the Act for violation or failure to comply with the law; and to examine all books, records, papers and accounts of warehouses licensed under the Act.

(8) Nothing in the Act shall be construed to conflict with or impair the effect of the laws of any state relating to warehouses, warehousemen, weighers, graders or classifiers. On the contrary, the Secretary of Agriculture is authorized to coöperate with officials charged with enforcing such state laws, and through such coöperation to secure the enforcement of the provisions of this Act. Heavy penalties are imposed for forging, altering, counterfeiting, falsely representing, or otherwise violating the terms of the Act.

(9) As in the case in the Grain Standards Act also, the law provides that should any part of the Act be declared invalid such judgment shall not affect the remainder thereof.

The Cotton Futures Act.—The YEAR BOOK for 1914 (p. 337) contained a detailed statement of the leading provisions of the United States Cotton Futures Act of Aug. 18, 1914, while the 1915 issue (p. 345) discussed the decision of Judge Charles M. Hough of the U. S. District Court in New York declaring the Act unconstitutional. The essential differences between the Cotton Futures Act of 1914 and the new measure are three in

number. In the first place, the seventh division of Section 5 confers authority upon the Secretary of Agriculture, should disputes be referred to him, to include in his findings a complete classification of the cotton for purposes of delivery on future contracts, whereas his findings under the 1914 Act were confined to the specific question of grade, quality, or length of staple in dispute. Section 6A of the 1916 law is entirely new, and provides an optional contract under which the parties may agree, without being subject to tax, that under certain specified conditions, the buyer may demand delivery of the basis grade named in the contract. Again, Section 11 of the Act of 1914, which taxed orders sent abroad for the making of future contracts on foreign cotton exchanges unless certain conditions were complied with, is omitted in the new law. This omission is of the greatest importance, since one of the principal arguments directed against the 1914 law was its interference with American transactions on foreign exchanges.

Leading Cases Affecting the Conduct of Business.—The year witnessed the rendering of four judicial decisions which deserve special mention because of their important bearing upon the conduct of corporate business. It is to be noted that in all, save one, the verdict was favorable to the defendant. Briefly summarized these decisions were as follows:

(1) The decision by Judge Rose in the U. S. District Court of Maryland in February refusing to order a dissolution of the American Can Co. on the ground that no good purpose could be served by a dissolution, especially since the Company for a number of years past had done nothing to indicate continued intent to throttle competitors by illegal methods. The Court's argument, in part, is as follows:

> Defendant once sought to emancipate itself from restraints of competition. Its power is great, but, as has already been pointed out, is limited by a large volume of actual competition and to a still greater extent by potential competition, from the possibility of which in the present state of the industry it cannot escape. Those in the trade are satisfied with it. They do not want it dissolved. Whether its dissolution would profit any one is doubtful. The first and immediate effect would almost certainly be the reverse, whatever larger good might in the end come from it. I am frankly reluctant to destroy so finely adjusted an industrial machine as the record shows the defendant to be. . . . A dislike for useless waste and destruction makes one loath to follow the authority which may be understood as requiring the breaking up of defendant's organization, in spite of its proved power for good, albeit with serious possibilities of evil. A like instinct rebels against taking any course which may hereafter involve this or any other tribunal going again over any part of the ground which in this proceeding has once been covered. Under the circumstances would it not be better simply to retain the bill?

(2) The decision in the U. S. District Court for the Southern District of New York, in June, in the suit of the U. S. Government under the Sherman Anti-Trust Act against the Corn Products Refining Co. The Court decreed the dissolution of the Company, and the verdict came as a surprise, especially because of the refusal of the Maryland Court in American Can Co. case. In this case the Court seemed unable to find any mitigating circumstances. Judge Hand, in his opinion, asserts that

> the officers of the Corn Products Refining Co. apparently had a custom of communicating with each other by typewritten, unsigned memoranda . . . and in the face of these memoranda, which for some strange reason were preserved, there can be no question in my mind of the continuous and deliberate purpose of the Corn Products Refining Co. by every device which their ingenuity could discover, to maintain as completely as possible their original domination of the industry.

(3) The decision of the New Jersey Court of Errors and Appeals in March (in the suit brought by the Island Heights & Seaside Park Bridge Co., a New Jersey corporation, against the Brooks & Brooks Corporation, a New York corporation) to the effect that foreign corporations doing business in New Jersey are not subject to the provisions of one of the "seven sisters" laws of 1913 (*A. Y. B.*, 1913, p. 344), which prohibits one company from purchasing or holding stock of another.

(4) The decision of the Federal Circuit Court of Appeals in January, sustaining the Victor Co. in its efforts to sell phonographs subject to use under prescribed conditions and

in connection with other products of the Company. The Court takes the view that the Dick mimeograph case (*A. Y. B.*, 1912, p. 522) "establishes the proposition that a restriction to use only with other products of the patentee is legitimate." In sustaining its position the Court says in part:

> A study of these various documents leads to the conclusion that complainant has undertaken to avoid making such a sale of its machine as would permanently pass it beyond any further control by itself. We think it has succeeded in so doing; this is not a sale outright, or a conditional or restricted sale, or any sale at all.
>
> Under the authorities the owner of a patent who manufactures machines under such patent can give the right to use to whom he pleases, upon what conditions he may choose to impose. We do not see why he may not give to one person a more restricted right to use than he does to another. . . .
>
> The documents are long and complicated, but it seems to us that this is what they provide for. We do not know why, under the law and the authorities, a patentee may not thus dispose temporarily of the use and ultimately of the title of a machine made by him and protected by his patent.

ECONOMICS

WESLEY C. MITCHELL

Theory.—At its January meeting the American Economic Association spent one session in discussing recent tendencies in economic theory. J. H. Hollander represented strongly that American economists have not paid due attention to the inductive testing of their doctrines. He favored a realistic mode of treatment, based upon extensive study of the processes of business life. W. C. Mitchell argued that the attempt to simplify economic theory by abstracting from the use of money has proved itself a failure. The animated discussion which followed showed anew how widely economists differ concerning the relative advantages of competing types of theory.

Further evidence to the same effect has been supplied by the critical reviews of F. A. Fetter's *Economic Principles* (*A. Y. B.*, 1915, p. 668), in which "the basis of value is conceived to be the simple act of choice and not a calculation of utility." H. J. Davenport contends that by dropping the word "utility" and putting nothing in its stead, Fetter has fallen into "a lamentable confusion both of terms and of thought" (*Jour. Pol. Econ.*, April). As "a student of economics and primarily of things other than value, price, and distribution," H. A. Millis prefers "a modernized Mill" to Fetter's type of theory (*Quart. Jour. of Economics*, May). C. W. Doten forebodes that if Fetter's example be adopted, "the business world and economists will no longer speak the same language" (*Am. Econ. Rev.*, June). Finally, A. C. Whitaker approves Fetter's type of theory as "mechanistic and Austrian," but laments that his statement has been much impaired by "a misguided deference for the 'new psychology'" (*Pol. Sci. Quart.*, September).

Constructive work shows no more unity of aim than criticism. There has been a dearth of systematic treatises during the year, but no dearth of brief contributions. A philosopher, R. B. Perry, fresh from the debate on value in the *Journal of Philosophy, Psychology, and Scientific Methods*, 1914-15, has offered a helping hand to clear up the relations between economic value and moral value (*Quart. Jour. of Economics*, May). Much the same issue has been discussed from a different viewpoint by J. M. Clark in his paper on "The Changing Basis of Economic Responsibility" (*Jour. of Pol. Econ.*, March). More technical in character is F. H. Knight's treatment of interest (*Quart. Jour. of Economics*, February); "the normal rate of interest," he concludes, "is . . . the anticipated productivity of the next unit of capital investment at the time under consideration."

Wages.—F. W. Taussig has analyzed the proposal to establish minimum wages for women by governmental agencies. Four-fifths of women workers, he finds, live at home; family life is so economical that the bulk of these workers are not "parasitic"; to insist upon giving them the minimum wage required to support

independent women would cause the discharge of many girls who are now helping to support their families (*Quart. Jour. of Economics*, May). The application of wage theories in arbitration cases is discussed by W. Compton (*Am. Econ. Rev.*, June). He shows that arbitrators run the gamut from "splitting the difference," through the "living wage" and "charging what the traffic will bear," to a comprehensive plan of altering the present scheme of distribution. H. P. Fairchild has adduced fresh evidence indicating that the common laborer's standard of living in this country has not risen and may well have fallen somewhat in the past 30 years (*ibid.*, March).

Valuation of Corporations.—A practical problem amenable to exact analysis is the economist's delight. Not even the theory of taxation receives more attention nowadays than the principles underlying governmental policy toward public utilities. G. P. Watkins has been studying certain technical features of electrical rates (*Quart. Jour. of Economics*, May and August), and R. Riegel of fire-insurance rates (*ibid.*, August); A. M. Sakolski has treated the valuation of railroad rights of way (*Am. Econ. Rev.*, June); M. O. Lorenz, cost and value of service in railroad rate making (*Quart. Jour. of Economics*, February); L. H. Haney, joint costs in railroading (*ibid.*); J. Bauer, the returns on public-utility investments, the allowance to be made for working capital (*Pol. Sci. Quart.*, June and September), and the basis of valuation in the return to be allowed upon investments (*Am. Econ. Rev.*, September). J. E. Sterrett has used the records of a large accounting firm to show that judges must allow more liberal profits to public utilities if their ability to secure needed capital is not to be jeopardized (*ibid.*, March). L. R. Nash (*ibid.*) and J. C. Bonbright (*Quart. Jour. of Economics*, May) have carried further the analysis of depreciation, and R. E. Heilman has attacked the complicated problem of interstate utility capitalization (*Jour. Pol. Econ.*, May).

Business Cycles.—Attention has been diverted from the ordinary course of trade fluctuations to the extraordinary conditions brought about in Europe and America by the great war and to speculations about the effects of peace when it comes. Studies of this character are too numerous to list; they are indeed more likely to be overvalued than to be overlooked by those interested in the current development of economics. One contribution of lasting interest, however, must be noted, W. M. Persons' "Construction of a Business Barometer" (*Am. Econ. Rev.*, December). Persons computes with due precautions the coefficients of correlation between index numbers of wholesale prices (which he accepts as the best single gauge of business conditions) and 25 other statistical series. From the series showing high coefficients, he constructs both a business "barometer" and a "one-year forecaster." This paper promises important results in stimulating further research along similar lines.

XIV. PUBLIC FINANCE, BANKING, AND INSURANCE

PUBLIC FINANCE

C. C. WILLIAMSON

FEDERAL FINANCE

Appropriations of Congress.—The grand total of regular, annual, deficiency, miscellaneous, and permanent annual and indefinite appropriations for the fiscal year 1916-1917 amounts to $1,626,439,209, which is the largest appropriation in the history of the country and more than half a billion larger than the aggregate for the year preceding. In addition to the direct appropriations, contracts are authorized to be entered into obligating Congress to make appropriations in the future amounting to $231,945,275, principally for naval and coast-defense purposes, in addition to an estimated amount of $295,000,000 which will be required to carry out the definite naval building programme authorized by Congress.

Actual appropriations for military and naval purposes and for additional seacoast defenses amount to $685,709,823, as shown in the following table (see also XII, *Military and Naval*):

Army Appropriation Act	$267,596,530.10
Naval Appropriation Act	313,300,555.84
Fortification Appropriation Act	25,747,550.00
Military Academy Act	1,225,043.57
Sundry Civil Appropriation Act	
Armories and arsenals	4,683,495.00
Military posts	1,616,000.00
Military surveys	35,000.00
Panama Canal fortifications	4,535,000.00
Deficiency appropriations, military and naval establishments	46,770,648.58
National Guard camps	200,000.00
Nitrate plant	20,000,000.00
Total	$685,709,823.09

Outside of the appropriations for national defense, the principal increases are for the Department of Agriculture, the Diplomatic and Consular Services, the Indian Service, the government of the District of Columbia, and for collecting the income tax. (See also V, *The National Government.*)

Receipts and Expenditures. — The following table shows the ordinary receipts and expenditures, and the financial transactions of the Panama Canal for the fiscal years ending June 30, 1915, and June 30, 1916, in millions of dollars:

	1915	1916
ORDINARY RECEIPTS		
Customs	209	212
Internal revenue:		
Ordinary	336	388
Corporation income tax	39	57
Individual income tax	41	68
Miscellaneous	67	53
Total	692	778
ORDINARY EXPENDITURES		
Civil and Miscellaneous	249	221
War	129	134
Navy	142	155
Indians	22	18
Pensions	164	159
Postal deficiency	7[1]	6
Interest on public debt	23	23
Total	736	716
Less unexpended balances repaid	2	....
Net ordinary disbursements	734	....
Excess of ordinary receipts over ordinary expenditures	....	61
Excess of ordinary expenditures over ordinary receipts	42	....
Balance in General Fund at close of year	82	235
PANAMA CANAL STATEMENT		
Expenditures	29	18
Total expended to June 30, 1916	$399,759,181	
From General Fund	228,711,200	
From Panama Canal bonds	138,600,869	
Total Panama Canal bonds authorized by law	375,200,980	
Total of bonds issued to date	134,631,980	

[1] Pay warrants drawn on account of postal deficiency for the year ending June 30, 1915, amounted to $6,636,593, as reported in the Treasury statement for June 30. The actual audited deficit of the Postal Service was $11,333,309.

Internal Revenue.—Internal-revenue collections for 1916 show an increase of $97,000,000 over 1915, making the largest amount ever received ($512,723,287). The principal items in this increase are from the income tax ($44,735,494), the stamp taxes ($17,615,808), and the tax on fermented liquors (barrel tax) collected under the War Revenue Act of Oct. 22, 1914 ($9,415,291), the ordinary tax on distilled spirits ($13,385,693), and on manufactured tobacco ($7,853,337). These remarkable increases are attributed largely to general prosperity.

Income Tax Receipts.—It is worthy of note in regard to income tax collections that more than one-fifth of the corporation income tax and over one-third of the individual income tax were received from New York City. The collections of the individual tax for each class of income for the last three years have been as follows:

	Rate, Per Cent.	1913–14 000 omitted	1914–15 000 omitted	1915–16 000 omitted
Normal tax	1	$12,728	$16,560	$23,996
Additional tax on net incomes of:				
$20,000 to $50,000	1	2,935	4,107	6,092
50,000 to 75,000	2	1,646	2,501	4,071
75,000 to 100,000	3	1,323	2,103	3,624
100,000 to 250,000	4	3,836	5,945	10,936
250,000 to 500,000	5	2,335	3,328	6,394
Exceeding 500,000	6	3,438	6,439	12,648
Received in compromise, etc	..	14	63	183
Total	..	$28,254	$41,046	$67,944

Public Debt.—The following is a statement of the public debt of the United States as of June 30, 1916:

Interest-bearing debt:	
2s, Consols of 1930	$646,259,550
3s, Loan of 1908–1918	63,945,460
4s, Loan of 1925	118,489,900
2s, Panama Canal Loan, 1906	54,456,980
2s, Panama Canal Loan, 1908	29,875,000
3s, Panama Canal Loan, 1911	50,000,000
3s, Conversion Bonds, 1916	5,900,600
3s, One-Year Treasury Notes, 1916	4,390,000
2½s, Postal savings bonds, 1911–1915	7,307,100
2½s, Postal savings bonds, 1916	938,000
Debt bearing no interest:	
United States notes (greenbacks), less gold reserve	193,701,990
National Bank notes (redemption account)	51,506,238
Old demand notes	53,153
Fractional currency	6,848,497
Debt on which interest has ceased:	
Funded loans of 1891	26,950
Loan of 1904	13,050
Funded loan of 1907	519,650
Refunding certificates	12,060
Old debt	901,390
Certificates and notes issued on deposits of coin and bullion:	
Gold certificates	1,217,882,769
Silver certificates	493,459,000
Treasury notes of 1890	2,254,000
Total interest-bearing debt	971,562,590
Total debt on which interest has ceased	1,473,100
Total debt bearing no interest	252,109,878
Total interest and non-interest bearing debt, June 30, 1915	1,225,145,568
Balance in Treasury	235,925,946
Warrants, coupons and checks outstanding	17,061,950
Net debt, June 30, 1916	1,006,281,572

The Treasury Balance.—The statement of the Secretary of the Treasury showed a net balance in the General Fund on June 30, 1916, of $235,925,946, the largest balance reported in recent years. This sum includes amounts to the credit of disbursing officers, as well as other items involved in the controversy over the form of the treasury statement (*A. Y. B.*, 1915, p. 325). A defense of the present method of making up the statement was issued by Secretary McAdoo on March 26.

Additional Revenues.—In his message delivered at the opening session of the Sixty-fourth Congress, President Wilson expressed opposition to the financing of preparedness plans by bond issues and urged a "pay as you go" policy. His specific recommendations included a lower exemption and higher surtax rates for the income tax, and taxes of one cent a gallon on gasoline and naphtha, 50 cents a horse power on automobiles and internal-combustion engines, 25 cents a ton on pig iron, 25 cents a ton on fabricated steel and iron, and a tax on bank checks (*A. Y. B.*, 1915, pp. 73, 353). With the exception of the increase of surtax on large incomes none of these recommendations was followed. Various other new

taxes and revenue measures preferred by Congress were included in an omnibus bill designed to raise an annual revenue of $205,000,000, which became operative on Sept. 9. The new act repealed at once the various stamp taxes on documents, stock transfers, telegrams, etc., imposed by the War Revenue Act of Oct. 22, 1914 (*A. Y. B.*, 1914, p. 344). It repealed also the tax on bankers and commission merchants. Other special emergency taxes due to expire on Dec. 31, 1916, were continued, including taxes on brokers, pawnbrokers, shipbrokers, custom-house brokers, theatres and places of amusement, circuses, bowling alleys, billiard tables, manufacturers of tobacco, cigars, and cigarettes. The tax on dealers in tobacco was omitted. This general revenue bill was divided into nine parts or "titles," the more important of which will be briefly outlined in the following paragraphs.

Income Tax.—The new income tax applies to the same incomes as the old, but, beginning with the tax collected in 1917 on 1916 incomes, the normal rate on both individuals and corporations is increased from one per cent. to two per cent. At the same time, "additional" rates on individuals having net incomes of more than $20,000 are increased as shown in the following table:

On Income of	New Rate, per cent.	Old Rate, per cent.
$20,000 to $40,000..	1	1
40,000 " 50,000..	2	1
50,000 " 60,000..	2	2
60,000 " 75,000..	3	2
75,000 " 80,000..	3	3
80,000 " 100,000..	4	3
100,000 " 150,000..	5	4
150,000 " 200,000..	6	4
200,000 " 250,000..	7	4
250,000 " 300,000..	8	5
300,000 " 500,000..	9	5
500,000 " 1,000,000..	10	6
1,000,000 " 1,500,000..	11	6
1,500,000 " 2,000,000..	12	6
2,000,000 and over.....	13	6

Non-resident aliens are to be taxed on income "from all sources within the United States," instead of on "net incomes" from property owned and business, trades or professions carried on within the United States. The personal exemption of $4,000 allowed to husband and wife living together is extended to include the "head of a family," and also to non-resident aliens who file a return of their total income in the United States. Deductions allowed are extended to cover taxes paid in foreign countries, certain kinds of losses, and an allowance for depletion of natural resources. Partners are allowed to deduct on account of income from exempt securities. Income from securities issued under the Federal Farm Loan Act is exempt.

The tax is now payable on or before June 15, instead of June 30. Various minor changes affecting both individuals and corporations have been made, with the object of improving administration and safeguarding the revenues. The Treasury Department has extended all its rulings to the new act, so far as they are applicable.

Inheritance Tax.—A Federal inheritance tax has been levied only three times in our history and each time as an emergency measure in time of war. A legacy tax was in force from 1797 to 1802, from 1862 to 1870, and again from 1898 to 1902. These were strictly legacy taxes, however, that is, a tax on personal estate, with the exception of the "succession tax" on real property levied in 1864 and repealed in 1870.

For many years a Federal inheritance tax has been advocated not only as a source of revenue but as a means of reducing "swollen fortunes." Hitherto the belief that this source of revenue should be left to the states has prevailed. Title II of the General Revenue Act, however, levies a progressive tax on net estates of decedents dying after its passage. The rate progresses from one per cent. on amounts in excess of $50,000 up to ten per cent. on the excess over $5,000,000. The exemption of $50,000 is supposed to be high enough to lessen complications between the state and Federal taxes. No exemption at all is allowed for property in the United States belonging to non-resident decedents. The tax is due one year after death, and if not paid within 90 days after it is due, a penalty of 10 per cent. per annum is added, or six per cent. if the delay is unavoidable. If paid before it is due, a

discount of 5 per cent. is allowed. Sworn returns must be filed for every non-resident estate and for every estate whose gross amount exceeds $60,000, or wherever the net estate is taxable. Transfers, creation of trusts, etc., made in contemplation of death, or within two years of death, are considered part of the estate.

Munitions Tax.—Title III of the General Revenue Act of Sept. 8 lays an excise tax of 12½ per cent. per annum on the entire net profits of munitions manufacturers. The method of calculating net profits is specified in the law. If the product is sold at less than its fair market value in such a way as to benefit some person interested in the business, the tax is then to be levied on gross receipts. The tax applies to all manufacturers of gunpowder and other explosives, except blasting powder and dynamite used for industrial purposes; projectiles, shells, torpedoes, fuses or complete rounds of ammunition; firearms of every kind used for military purposes; electric motor boats and submarines; and parts of any of these articles. The first "taxable year" is the calendar year 1916. Returns must be filed before March 1 and the tax is due within 30 days after notice from the collector of internal revenue. The tax becomes inoperative one year after the close of the European War. If the war should stop suddenly, it is assumed that the customs duties will increase sufficiently to make up for loss of revenue from this source.

Miscellaneous Taxes.—The tax of $1.50 a barrel imposed by the War Revenue Act on fermented liquors was retained. Much attention was given to the wine tax and radical changes were made in the provisions of the act of 1914, but the classification and rates are too complicated to be explained here.

Corporations, joint stock companies, insurance companies, etc., having a capital stock represented by shares must pay a special tax of 50 cents annually for each $1,000 of the fair value of their stock, including surplus and undivided profits. An exemption of $99,000 is allowed. Corporations paying the munitions tax may deduct it from this special tax. Details of administration of this act were left entirely to Treasury Department regulations, which were issued on Oct. 19.

Upon the gross receipts of copper smelters a tax is levied equivalent to one per cent. when receipts are from $25,000 to $1,000,000, two per cent. when from $1,000,000 to $10,000,000, and 3 per cent. for larger amounts.

Tariff Commission.—The tariff-commission idea has been steadily gaining favor with the country, but until 1916 it had not been espoused by the Democratic party. The Taft Tariff Board was abolished by Democratic failure to provide funds. In 1915 President Wilson asserted that the Government already had all the machinery necessary to make tariff investigations. Early in 1916, however, he changed his views and vigorously advocated a tariff board to secure facts upon which Congress may act in making any changes required in the tariff laws.

The Tariff Commission created by the General Revenue Act is to consist of six members appointed by the President and confirmed by the Senate for a term of 12 years. The salary is $7,500 and members are not permitted to have any other business or employment. Not more than three of the six members may belong to the same political party. It is the duty of the Commission to investigate the administrative, fiscal and industrial effects of the tariff laws; the relation between the rates of duty on raw materials and finished or partly finished products; the effect of *ad valorem* and specific duties; the effect on revenues, industry and labor; tariff relations between this and other countries, etc.; commercial treaties, preferential arrangements, bounties, etc.; and all questions relating to the arrangement of schedules and classifications. The Commission is required to report upon all the information it may have acquired on these subjects whenever requested to do so by the President, the Ways and Means Committee of the House or the Finance Committee of the Senate. It may be required also by any one of these three powers to make any special investigation they may deem necessary.

Tariff Amendments.—On April 22 Congress repealed the free-sugar

clause of the Underwood Tariff Act, which would automatically have gone into effect on May 1, causing a loss of $42,000,000 annually. This repeal was disapproved by many Democrats, who regarded it as a violation of the promise contained in the "free-sugar" slogan so widely used in the 1912 campaign. Another departure from Democratic doctrine was the duty of 30 per cent. levied on imported dyestuffs and on medicinals and flavors. Free-trade sentiment is appeased, however, by providing for a gradual reduction of the duty beginning five years from the passage of the Act. In still another direction the Democratic Congress compromised with the protectionists. For the misdemeanor of "dumping" goods on the American market for the purpose of crushing home industry, a fine of $5,000 is imposed. The Revenue Act also provides heavy fines and retaliatory measures for embargoes against the United States. In broad terms the President is authorized to act for the protection of American commerce and against interference with the rights of American vessels. (See also I, *The Sixty-Fourth Congress.*)

STATE AND LOCAL FINANCE

In 1916 regular sessions of the legislatures were held in but 11 states. In some of these important financial legislation was enacted. In an unusual number of states special sessions were held, but these were usually brief and gave little or no attention to financial questions.

Budget Procedure. — The interest manifested in 1915 in improved budgetary methods (*A. Y. B.*, 1915, p. 355) was taken up in 1916 in three states (see also VI, *State Administration*). The legislature of Maryland submitted to the electorate a constitutional amendment (Ch. 159) which gives the state an executive budget system. It is provided that the governor shall present to the legislature soon after it convenes a budget giving a complete plan of proposed expenditures and estimated revenues for the two succeeding fiscal years, and showing also current assets, liabilities, reserves, surplus or deficit and the debts and funds of the state. In making up his budget the governor may require departments, offices and institutions desiring appropriations to submit such information and in such form as he may direct. He may also hold public hearings and require the attendance of department heads and other officials. Estimates for the legislature, judiciary and public schools must be included without revision, but most other estimates the governor may revise as he chooses, and at any time before final action may make corrections, amendments or supplements. The legislature may increase or diminish items relating to itself, and may increase items relating to the judiciary, but beyond that may only strike out or reduce items included in the governor's budget. Until the budget bill has been finally acted upon, additional appropriation bills may not be considered, and every such supplementary appropriation must be embodied in a separate bill limited to a single object. It must also receive a majority vote of all members elected and must provide a tax to cover the amount of the appropriation.

The New Jersey legislature also made provision for a modern executive budget (Ch. 15). Every state department, office or institution desiring an appropriation must submit detailed requests to the governor by Nov. 15, using forms provided and giving reasons for increases or decreases. At the same time the comptroller and the treasurer jointly must submit to the governor a summary of the financial condition of the state, including receipts and expenditures for the current and preceding year and the sources and probable amount of revenue for the next fiscal year. In his examination of these estimates the governor may summon witnesses and conduct hearings or appoint officers or other persons to hold hearings. His budget message is to be printed and distributed to the press and to all public libraries. The governor must not recommend appropriations in excess of the anticipated revenues; but if he thinks it necessary, he may suggest plans for raising additional revenue. Flexibility in the execution of the budget is secured by giving the State House Commission power to

permit transfer between items. A defect which may be pointed out in this law, as well as in the Maryland plan, is the failure to secure full publicity by requiring executive officers to appear before the legislature to answer questions.

In New York State the admirable budget procedure worked out by the constitutional convention in 1915 and defeated at the polls (*A. Y. B.*, 1915, p. 355) was revived by Governor Whitman, who, on the opening day of the 1916 legislative session, submitted a tentative budget as an object lesson in favor of an executive budget. A bill was also introduced to carry out the main budgetary provisions of the defeated constitution, but this bill was pigeonholed and another introduced and passed which gives the state a legislative budget in the making of which the executive has but little voice. The finance committee of the Senate and the ways and means committee of the House, acting jointly or separately, are required (Ch. 130) to prepare and submit to their respective houses not later than March 15 a complete and detailed budget, accompanied by an itemized and detailed statement of the probable revenues and such other data as they wish to submit. These two committees have power to sit continuously and to appoint subcommittees to gather information as to financial needs. Upon the clerks of these committees, acting independently or jointly as they choose, is laid also the duty of collecting information in regard to revenues and the appropriations requested, as well as the duty of aiding in the preparation of the budget generally and making investigations requested by the legislature. The faults of such a budget procedure are too obvious to require comment. The following criticism by one competent authority seems to be entirely justified. The new law, he says,

> will make the committee on finance and the committee on ways and means, both of which are irresponsible and are almost unknown to the public, the absolute masters over the administrative departments of the state. With deadly precision, guaranteed by a paid staff of searchers, they can tear open, tear down, and build up administration at their will . . . [It] will put into their hands the machinery for wresting away from the governor such shreds of executive power as are now left to him. . . . The office of governor might as well be left vacant.

An act passed in Louisiana (Laws of 1916, Act No. 168) submitted amendments to the constitution providing for the creation of a Board of State Affairs, with power to exercise such authority relative to budget, income and expenditure as may be conferred upon it by the legislature. These amendments were ratified by the electors on Nov. 7. Subject to the ratification of these constitutional amendments, the legislature established (Laws of 1916, Act No. 140) a Board of State Affairs consisting of three members to be appointed by the governor for terms of six years at a salary of $5,000. This Board may require every state department and institution receiving state funds to submit to it on prescribed forms at least 90 days before the meeting of the General Assembly an estimate of its revenues and expenditures for each year of the ensuing biennial period. After reviewing these estimates, which are to be completed not later than March 15, the Board is required, on or before April 1, to recommend to the legislature a budget showing the amounts requested, the amounts recommended, and the amounts granted for the preceding biennial period, with the reasons for its action. The budget as recommended must be printed, together with any recommendations the minority or the governor may wish to make, and distributed to the members of the legislature on or before April 25. This board is required also to investigate the feasibility of a central board of control for public, educational, charitable and eleemosynary institutions, as well as of a central purchasing, selling and exchange bureau. It is required also to investigate the work of public bodies for the purpose of effecting greater economy in the cost of public work.

Tax Commissions. — Special tax commissions previously authorized have been at work in several states, and in several others new commissions have been created during the year. The Massachusetts Commission, created by a resolve of 1915, reported in January, 1916. The princi-

pal one of its 10 recommendations was the passage of an income-tax law which is discussed below.

Under the guidance of the Kentucky State Tax League, the Kentucky legislature provided for a special commission (Ch. 137) to investigate the whole question of state taxation and frame a new revenue and tax law in conformity with the constitutional amendment adopted in November, 1915, which made possible a classification of property. This committee consists of four members of the 1915 House of Representatives and three members of the 1915 Senate, appointed by the governor, all to be "persons familiar with revenue and taxation and the laws relating thereto." Members of the commission serve without pay but are authorized to employ an expert investigator.

Two new permanent tax commissions have been added to the list. The legislature of Mississippi created (Ch. 98) a Board of State Tax Commissioners of three members, who are appointed by the governor, with the advice and consent of the Senate, for a term of four years, at a salary of $2,500. They are required to devote their entire time to the duties of their office. The commission is authorized to adjust and equalize valuations throughout the state. One or more of its members must visit every county in the state each year to confer with local assessors. Aside from its power of equalization, the commission has little actual control over the tax system. Its principal function seems to be one of investigation and recommendation.

In Louisiana the State Board of Affairs, in addition to its budget-making powers described above, supplants the State Board of Appraisers and the State Board of Equalization and becomes in effect a state tax commission with power to assess ordinary property throughout the state for state purposes. It is also to assess the property of railway, telegraph, telephone, sleeping car and express companies for all purposes. While the local authorities may for local purposes assess property at not less than 25 per cent. of its cash value, the Board has very wide powers of control over the local assessors.

While only the two additional permanent tax commissions were established in 1916, minor changes have been made in the laws under which the commissions operate in a number of states. The legislature of Maryland passed an act (Ch. 629) giving its Commission power to order the county supervisors of assessment to appoint assessors, removable by the Commission for cause, while the Commission itself is empowered to appoint such other assessors as it "may consider necessary." The act also gives the county supervisors power to assess.

Amendments in Rhode Island (Ch. 1346) and in South Carolina (No. 553) provide an increase of salary for the chairman of the Tax Commission. Five new sections are added to the South Carolina law. One of these gives the commission broad powers of equalization and prescribes the procedure. A board of review of seven members appointed by the governor, one from each congressional district, is established to hear appeals from the decisions of the Tax Commission. This board has power to reverse the action of the Commission, in which case it must make a full report to the governor. The name of the *ex officio* commission created in Virginia in 1915 was changed (Ch. 215) from State Advisory Board on Taxation to State Tax Board. The powers of the board are more fully defined and somewhat enlarged.

Every newly created commission, if efficient and impartial in the discharge of its duties, is bound to incur the hostility of one group or another within the state. Bills emasculating the Maryland Commission and even abolishing it entirely were introduced. The most interesting attack, however, occurred in Colorado. The Colorado Commission was established in 1911 with the special object of securing full-value assessments and fair equalization among the different sections of the state. From the beginning it encountered opposition, which culminated on July 5, 1916, in the filing of an "initiated" bill to abolish the Commission and transfer the administration of the law to the state Board of Equalization. The dissatisfaction was largely confined to the

city of Denver, where the chief complaint was that the Commission had raised the assessments too much. An impartial investigation made by Dr. Robert Murray Haig, of Columbia University, for the State Survey Committee, showed not only that the opposition to the Commission was based on insufficient grounds, but that much positive good had been accomplished. The bill abolishing the Commission was defeated by the electors on Nov. 7.

Income Taxes.—Perhaps the most important single piece of tax legislation enacted in 1916 is the Massachusetts income-tax law. A constitutional amendment giving the legislature full power to levy income taxes was ratified by the voters in November, 1915, by an overwhelming majority. In authorizing a special tax commission in 1915 the legislature anticipated the adoption of this amendment by instructing the commission to draft a law providing for the taxation of incomes. The measure submitted by the commission in January was enacted (Ch. 269) substantially as recommended and the first tax is to be levied in Jan., 1917.

The new law does not provide a general tax on all incomes, but applies only to incomes from certain specified sources. It is in the nature of a substitute for the personal-property tax but only in respect to intangibles. Real estate and tangible personal property are in no way affected by it. Interest from bonds, notes, etc., and from certain dividends of corporations, partnerships, associations and trusts, is taxed at the rate of 6 per cent., an exemption of $300 being allowed if the total income from all sources is less than $600. Income from annuities, and the excess over $2,000 from professions, trade or business is to pay at the rate of 1½ per cent. An exemption of $300 in the case of annuities is permitted if the total income from all sources is less than $600. An exemption of $500 is permitted for a husband or wife and $250 for each child or dependent parent, although the total deduction under this head may not exceed $1,000. On the excess of gains over losses from speculation dealings in intangible personal property a rate of three per cent. is imposed. Every inhabitant of the state, including partnerships, associations and trusts, whose annual income from all sources exceeds $2,000, is required to make a return on or before March 1 with reference to income received during the preceding calendar year. Heavy penalties are imposed for failure to make returns or for making incorrect returns. Various exceptions, exemptions and deductions are provided for. Among other important features of the law are its abolition of the tax on intangible personal property, deduction on account of indebtedness, its administration by state officials, and the use of "information at the source." The method of administration provided is a practical guarantee that the law will be enforced. It is to be administered by the state tax commissioner, who is authorized to divide the state into income-tax districts and appoint for each district an income-tax assessor, who need not be a resident of the district and who may be transferred from one district to another. Instead of the method of "collection at the source" employed in the Federal income tax the Massachusetts law uses a system of "information at the source."

In New York a majority report of the committee appointed to investigate taxation (Mill's Committee) recommended a state income tax and a bill was introduced providing a tax on incomes above $1,500. The bill was not reported, but the committee was continued for another year and it is expected that an income-tax bill will be reintroduced and its enactment urged by legislative leaders.

Inheritance Taxes.—The most interesting inheritance-tax law of the year is that of Rhode Island (Ch. 1339), which imposes a tax of one-half of one per cent. on the net estates of decedents, both resident and non-resident, when the value exceeds $5,000. It also taxes transfers of property within the state, whether by will or by other means, if made without adequate consideration and in contemplation of death. Only two classes of heirs are recognized. On direct heirs, the tax progresses from one-half of one per cent. on property valued at $25,000 to $50,000 to three per cent. on all amounts in excess of $1,000,000.

All others pay at the rate of five per cent. on amounts from $1,000 to $50,000, up to eight per cent. on amounts above $1,000,000. The law is administered by the Tax Commission.

A Kentucky act (Ch. 26) repeals the inheritance-tax law of that state and enacts a new one, under which the primary rate varies from one per cent. on property passing to husband, wife, lineal issue, lineal ancestor or adopted child, to five per cent. in the case of collateral heirs, strangers and bodies politic or corporate. Property bequeathed to municipal corporations for public purposes is exempt. Exemption for a widow and each minor child is $10,000. For other classes of heirs the exemption is graded down to $500. On estates in excess of $25,000, the rate progresses from one and one-half to three times the primary rate on the excess over $500,000. The rate may therefore reach 15 per cent. on the larger estates passing to collateral heirs.

In New York important changes were effected in grades, exemptions and rates. Rates now range from one per cent. on direct heirs to eight per cent. on collateral. The grades at which progressive rates apply were reduced and most of the exemptions lowered, except to the immediate family (Ch. 548). Certain beneficiaries formerly included in the direct class now constitute a new class at a higher rate. Capital employed in business by non-residents was made taxable (Ch. 323). To prevent evasion, the term "resident" was defined (Ch. 551) to include any person who lives in New York for the greater part of the year within two years preceding death. This act therefore repeals the provisions of the 1911 act which exempted the intangible property of non-residents and will probably result in double taxation and litigation. A 1915 amendment taxed to the survivor intangible property held jointly by two or more persons. The word "intangible" was stricken out in 1916 (Ch. 323), so that now *all* property in joint ownership is taxable to the survivor.

Slight changes in the inheritance-tax laws have been made in other states also. In Maryland (Ch. 669) the Tax Commission's control over appraisals is strengthened. Minor amendments (Ch. 81) were made to the Virginia collateral-inheritance tax.

License Taxes.—A large deficit in the state treasury of Maryland called for additional sources of revenue. The liquor licenses, licenses on motor vehicles, and on commissions of executors and administrators were increased. An act (Ch. 676) was also passed taxing the gross receipts of freight-line companies. A radical and comprehensive act (Ch. 704) also imposes state licenses with graduated rates on a great variety of business activities.

Mississippi imposed (Ch. 90) a license on dealers in coffins. The rate is from $25 to $100, according to population, with $10 additional for embalming. The business of operating "grab cars," or commissary cars, must also pay a license (Ch. 91) of $50 to $100. An additional license tax is placed on the oyster business (Ch. 94) and the tax on peddlers amended (Ch. 89).

Louisiana levied (Act No. 34) on manufacturers of cottonseed oil an annual license of $5 to $75, based on gross receipts.

Intangible Personal Property.—The New York legislature reënacted the secured debt tax in substantially the form of the original act of 1911, as amended by the 1915 law (Ch. 261). The rate is changed to 75 cents per $100, or fraction thereof, instead of three-quarters of one per cent., so as to require fewer denominations of stamps. Payment of the tax exempts the security, as under the 1915 law, for a period of five years. The period for registration and payment expires on Jan. 1, 1917. The act applies chiefly to mortgages and bonds secured by real property in other states, and bonds not payable within one year secured by other than real property, including all public bonds of other states and countries and their political subdivisions. Debt secured by property partly within and partly without the state is a "secured debt" in such proportion as the mortgaged property outside the state bears to that within the state. The provision that debts may not be deducted from the taxable value of secured debts

was changed to permit those engaged in the business of buying and selling securities to which the law applies to deduct indebtedness therefrom, if they are not held for a longer period than eight months.

It is the evident intention of the legislature to avoid discriminating between mortgage bonds and debts secured by property within the state, and those secured by property partly or altogether outside the state. The amendment referred to accomplishes this, but it seems to be superseded by another law passed in 1916 (Ch. 335) which provides that the owner of a mortgage secured by real property located partly within and partly without the state may pay the tax on the entire amount of the mortgage and secure complete exemption from local taxation. It further provides that in cases in which the mortgage-recording tax has been paid upon an apportioned value the remainder of the tax may be paid and the entire mortgage or bond exempted.

The New York mortgage-recording tax was still further amended (Ch. 337) in order to extend the same treatment to mortgages recorded prior to July 1, 1906, when the original act went into effect. The attorney-general had held that such mortgages could be exempted only in respect to property situated within the state. This privilege now applies to mortgages secured by property situated without the state as well.

In the District of Columbia a tax of four mills has been levied on moneys and credits, including moneys loaned and invested, and bonds and shares of stock, with certain exceptions (District of Columbia Appropriation Act, Sept. 1, 1916.)

Constitutional Amendments. — A resolution adopted by the Illinois legislature was approved by the voters at the general election of Nov. 7. Of itself the amendment makes no change in the tax system, but it gives the legislature power to classify personal property, provided that any tax on personal property be uniform as to persons and property of the same class. A similar provision was included also in an amendment to the tax article of the Utah constitution, rejected at the November election.

In August an initiative petition, filed with the secretary of state of California, required the submission of an amendment to the constitution providing that after Jan. 1, 1917, all public revenues should be raised by a tax on land values, exclusive of improvements. To leave no doubt that the purpose of the amendment was to establish the single tax, it was stated that: "The intent of the provision is to take for public use the rental and site values of land, and to reduce land holding to those only who live on or make productive use of it." Taxes on incomes and inheritances are specifically permitted in order to provide funds for old-age pensions, mothers' pensions, and unemployment and disability insurance. The amendment was defeated.

In Oregon also the single taxers attempted by means of the initiative and referendum to secure the adoption of a single tax amendment, known as the "Full Rental Value Land Tax and Home-Makers' Loan Fund Amendment." It was overwhelmingly defeated.

Amendments of minor importance were passed upon by the voters at the November election in several other states. In the state of Washington a measure requiring the adoption of a budget by local government units and limiting the manner of expending the revenues was voted upon. Rhode Island adopted an excess-condemnation amendment. Amendments approved by the legislature of Nevada in 1913 and 1915 were adopted by the voters on Nov. 7. One of them related to revenues to be used for educational purposes and the other changed the limit of the state debt from $300,000 to one per cent. of the assessed valuation of property within the state. The voters of Montana adopted one amendment creating county and state boards of equalization but rejected another relating to exemption from taxation. An amendment rejected by the voters of Georgia gave the legislature power to exempt from taxation vessels owned by Georgia citizens and engaged exclusively in foreign commerce. A similar measure was adopted, however, by the people of Louisiana. (See also VI, *Amendments to State Constitutions.*)

BANKING AND CURRENCY

RAY S. WESTERFIELD

The Currency.—The chief features of the currency situation as reported on Oct. 1, 1916, are: (1) an increase during the year of 495 millions in gold, 350 of which is circulated by additional gold certificates; (2) an increase of 75 millions of Federal reserve notes issued; (3) the gold holdings against the Federal reserve notes, 10.6 millions of gold and 184.2 millions of gold certificates, a total of 195 millions, against 215 millions issued; (4) the appearance of a new form of currency, the Federal reserve bank notes, to the amount of 10 millions; (5) a decrease of 53 millions in the national bank notes outstanding; and (6) a grand total increase of money in circulation by 450 millions, raising the *per capita* circulation from $36.88 to $40.62 in one year's time. All this increase is more than covered by the 495 millions of gold increase; the inflation is one of gold, not of paper. The following table summarizes the currency situation on Oct. 1 for the years 1915 and 1916:

STATEMENT OF THE CURRENCY, 1915–16

Forms of Currency	General Stock of Money in the United States (millions)		Held in Treasury as Assets of the Government (millions)		Held by Federal Reserve Banks and Federal Reserve Agents against Federal Reserve Notes (millions)		Money in Circulation (millions)	
	Oct. 1, 1915	Oct. 1, 1916	Oct. 1, 1915	Oct. 1, 1916	Oct. 1, 1915	Oct. 1, 1916	Oct. 1, 1915	Oct. 1, 1916
Gold coin (including bullion in Treasury)	$2,141.8	$2,636.0	$199.5	$275.6	$7.8	$10.6	$615.9	$644.9
Gold certificates	.....	.....	26.0	....	120.2	184.2	1,172.3	1,520.7
Standard silver dollars	568.3	568.3	9.4	13.6	....	....	65.1	69.5
Silver certificates	.....	.....	9.8	....	....	....	481.7	483.1
Subsidiary silver	186.8	189.9	24.7	11.4	....	....	162.1	178.5
Treasury notes of 1890	.....	.....	.....	.....	....	....	2.2	2.1
United States notes	346.7	346.7	8.9	4.2	....	....	337.7	342.4
Federal-reserve notes	140.4	215.2	7.6	2.7	....	....	132.8	212.5
Federal-reserve bank notes	.....	10.0	....	....	....	....	....	9.9
National bank notes	786.7	733.3	26.2	18.6	....	....	760.5	714.7
Total currency	4,170.6	4,699.4	312.3	326.1	128.0	194.8	3,730.3	4,178.5
Per capita circulation	.....	.....	....	....	....	....	36.88	40.62

THE BANKING SYSTEM

The National Banking System.—The number of national banks reporting on Sept. 2, 1915, was 7,613; on Sept. 12, 1916, the number was 7,589, a decrease of 24. The sectional distribution was as follows:

Section	Number of banks		Change	Resources, Sept. 12, 1916	Capital, Surplus and Undivided Profits, Sept. 12, 1916
	Sept. 2, 1915	Sept. 12, 1916			
New England	434	414	−20	$1,106,800,000	$199,346,000
Eastern states	1,652	1,647	−5	5,948,096,000	669,167,000
Southern states	1,586	1,588	+2	1,589,652,000	317,579,000
Middle states	2,101	2,111	+10	3,767,925,000	516,484,000
Western states	1,298	1,296	−2	978,250,000	124,576,000
Pacific states	535	526	−9	1,013,830,000	152,625,000
Island possessions	7	7	0	6,984,000	1,252,000
Total	7,613	7,589	−24	$14,411,537,000	$1,981,033,000

The shifts in the various items of resources and liabilities for the year for all the banks combined are indicated in the following table:

	Sept. 2, 1915 (thousands)	Sept. 12, 1916 (thousands)	Per cent. Change
RESOURCES:			
Loans and discounts	$6,756,680	$7,859,837	+16
United States bonds	781,726	729,777	−7
Other bonds and securities	1,311,809	1,624,627	+24
Due from Federal reserve banks	315,409	531,028	+68
Due from approved reserve agents	811,379	936,339	+15
Cash	842,608	768,123	−9
Customers' liability under letters of credit	52,321	77,512	+48
Customers' liability under acceptances	16,461	77,879	+375
Other assets	1,398,694	1,729,353	+17
Total	$12,267,090	$14,411,537	+18
LIABILITIES:			
Capital, surplus and undivided profits	$2,091,459	$2,116,024	+1
National banknotes outstanding	718,496	674,115	−6
Due to banks and bankers	2,459,607	2,915,663	+18
Individual deposits	6,762,182	8,445,649	+25
Notes and bills discounted	45,550	[1]	.....
Letters of credit	55,137	81,182	+47
Acceptances based on exports and imports	13,077	76,608	+488
Other liabilities	121,578	102,296	.....
Total	$12,267,090	$14,411,537	.....

[1] Beginning with Sept. 12, 1916, notes and bills discounted are not included in loans and discounts, as was previously the custom.

In a report issued by the Comptroller of the Currency in June, 7,538 of the 7,578 member banks of the Federal reserve system reported 14.3 millions of depositors, an increase of 86 per cent. in six years; the largest absolute increase was in the Middle Western states, but the percentage increase was greatest in the southern Pacific states. There is a practical equality between the number of depositors in the national banks and the number of depositors in all the state banks (excluding mutual and stock savings banks). Of the depositors, 85 per cent. deposited in country banks and 12 per cent. in reserve-city banks. Two-thirds were demand deposits. During the year deposits increased more rapidly than ever and, reversing the ordinary relation, faster than loans, even at low rates of 2½ to 3½ per cent. The number of national banks has not been increasing; there was a net decrease, but their resources are growing, absolutely and relatively, faster than all state banks, trust companies, savings and private banks and loan companies combined. The distribution of reserves of the national banks and the per cent. carried and the excess carried above requirements are indicated in the following table:

	Held		Required		Excess, Millions
	Millions	Per cent.	Millions	Per cent.	
By banks in central reserve cities	$542.3	20.4	478.7	18.0	63.5
By banks in other reserve cities	659.3	24.8	398.8	15.0	260.5
By county banks	1,033.8	26.6	466.6	12.0	576.6
Total	$2,235.4		$1,343.8		$891.7
Increase since Sept. 2, 1915	266				23

The results of the call of Nov. 17, published late in December, are particularly interesting because it marks the second anniversary of the Federal reserve system. In his press statement the Comptroller of the Currency paraded the increases in resources of the national banks. He showed that their aggregate resources were $15,520 millions, an increase of $4,028

millions, or 35 per cent., in two years, which increase was three times as great as had ever been shown in any two-year period in the history of our national banks; that the resources had doubled in the past decade, the rate of increase for the decade 1904-14 being six per cent. and for the two years 1914-16 being 18 per cent. per year; that geographically the increases for the two years were distributed as follows: the banks of New England 22 per cent., of the Eastern states 39 per cent, of the Southern states 32 per cent., of the Middle Western states 31 per cent., of the Western states 50 per cent., and of the Pacific states 33 per cent.; and that the increases between the calls of Sept. 12 and Nov. 17, 1916, were the greatest ever shown between calls, averaging 7.69 per cent.; and distributed among the groups of banks in the order named above, as follows: 3.36 per cent., 6.84 per cent., 15.98 per cent., 5.71 per cent., 11.76 per cent., 7.87 per cent. Between these two calls the ratio of total reserves to deposits increased from 24.29 per cent. to 24.78 per cent., and with the exception of bills payable and rediscounts, which decreased 18 millions, all items increased by the following amounts:

	Millions
Total resources	$1,109
Deposits	1,126
Loans and discounts	485
Capital stock	3
Surplus and undivided profits	23
Specie and legal tender	20
Amount due from banks	420
Reserves	237

State banks have not shown much inclination to join the Federal reserve system, and the rate of admission has declined. The policy of the Federal Reserve Board has been liberal in its regulations and terms of admission but without results. The total number which had entered the system at the time of the September call was 36, of which four banks were in the central reserve cities, nine in the other reserve cities, and 26 were country banks. The resources of these groups were, respectively, $257 millions, $169.8 millions, and $12.3 millions, totaling $439.2 millions. Unfortunately, the Illinois Supreme Court in December, 1915, denied the national banks the right to exercise trustee functions in the state (under Sec. 11k of the Federal Reserve Act). The antagonism toward this section of the law has been particularly bitter in Michigan, where trust companies are not permitted to engage in commercial banking. In states where trust companies transact practically the same kind of business as national banks the opposition to granting trust powers is practically negligible. Judge Brooke of the Supreme Court of Michigan in a decision recently handed down contends that Section 11k is ineffective for three reasons: (1) because Congress has not the constitutional authority to confer such powers upon national banks; (2) because, even if Congress possessed such authority, it cannot delegate such powers to the Federal Reserve Board; and (3) because the granting of such powers would be in contravention of the state law. The first and the third of these opinions agree with the Illinois decision, but the courts disagree on the second point. If other states are equally jealous of their rights to retain control of the descent and distribution of property the result will be the arrest of the integration of our banking system.

Comptroller of the Currency.—The Comptroller of the Currency has continued to be the object of bitter attack during the year. Numerous parties advocate the abolition of his office, particularly groups within the different bankers' associations. They argue that his office overlaps the functions of the Federal Reserve Board and that his office is anomalous in several respects; they resent his interference with interest rates, and his requirement of what appears to them as excessive amounts of reports, and his personal characteristics. His prosecution of the Riggs National Bank (*A. Y. B.*, 1915, p. 367) was finally adjudicated by the Supreme Court of the District of Columbia. The issue was that (1) the Court dismissed the charges of perjury against the bank officials; (2) the charges of conspiracy against the Comptroller of the Currency and the Secretary of the Treasury were not sustained; (3) the Secretary was not sustained in

RESOURCES AND LIABILITIES OF INSTITUTIONS UNDER STATE CHARTERS, JUNE 30, 1916

(*In Thousands of Dollars*)

	State Banks[1]	Mutual Savings Banks	Stock Savings Banks[2]	Loan & Trust Companies[3]	Private Banks[4]	Total Banks
Number reporting	15,450	622	1,242	1,606	1,014	19,934
RESOURCES:						
Loans and discounts (including overdrafts)	$3,406,981	$2,221,426	$713,987	$3,704,368	$117,715	$10,164,480
Investments (bonds, securities, etc.)	693,287	1,999,131	131,404	1,605,392	14,393	4,443,609
Banking house (including furniture and fixtures)	140,944	39,811	31,749	105,489	4,420	322,415
Other real estate owned	52,304	19,452	7,429	82,329	7,343	168,859
Due from banks	817,578	210,919	111,099	850,499	28,610	2,018,706
Checks and other cash items (including exchanges for clearing house)	132,262	2,753	2,416	109,990	1,077	248,500
Cash on hand	271,753	26,135	32,821	329,456	6,347	666,515
All other resources	37,865	28,310	2,420	240,742	1,943	311,282
Total resources	$5,552,977	$4,547,941	$1,033,328	$7,028,269	$181,852	$18,344,369
LIABILITIES:						
Capital stock paid in	$63,497	.....	$72,870	$475,832	$16,852	$1,129,052
Surplus fund	268,821	$303,300	30,595	508,822	6,763	1,118,304
Undivided profits	91,152	51,380	16,103	96,669	3,181	258,487
Due to banks	217,212	868	6,405	525,008	1,174	750,668
Dividends unpaid	3,081	.....	349	4,125	34	7,591
Individual deposits	4,296,253	4,186,976	901,610	5,198,496	146,765	14,730,102
Postal savings deposits	4,457	943	881	4,826	.....	11,108
Notes and bills rediscounted	15,495	.....	878	3,283	524	20,181
Bills payable	56,893	84	1,082	16,127	3,730	77,918
Other liabilities	36,113	4,387	2,550	195,077	2,824	240,953
Total liabilities	$5,552,977	$4,547,941	$1,033,328	$7,028,269	$181,852	$18,344,369

[1] Includes reports of stock savings banks for Virginia, South Carolina, Tennessee, Wisconsin, North Dakota, Kansas, Montana, Idaho, and Nevada. Includes trust companies for Virginia, North Carolina, South Carolina, Tennessee, Idaho and Nevada. Includes private banks for North Carolina and Idaho. [2] Stock savings banks for nine states included with state banks. [3] Trust companies for six states included with state banks. [4] Private banks for two states included with state banks. Includes banks not under state supervision.

holding up some bond interest belonging to the bank pending the payment of fines assessed on the bank for refusal to comply with demands made by the Comptroller for certain transactions of the bank; and (4) the Comptroller was not enjoined from calling for such reports in the future. Another line of attack has been that the cost of bank examinations has increased under Mr. Williams' administration; the Comptroller in his reply has published a full statement showing that the bigger banks pay less than formerly and the smaller banks pay more than formerly, but the latter increase is justified by the expense of better examinations.

State, Savings and Private Banks, Loan and Trust Companies.—Conforming to the call of June 30, the institutions under state charters reported to the Comptroller of the Currency their resources and liabilities. These institutions numbered 19,934 banks, an increase over June 23, 1915, of 477, and their resources had increased 2,333 millions. The accompanying table lists the main items in the financial statements of these institutions.

Postal Savings System.—By amendment of the Act establishing the postal-savings system, the restriction of the amount of deposits which may be made by a depositor in any one month was raised from $500 in interest-bearing accounts to $1,000, and the deposit of an additional amount up to $1,000 non-interest bearing was provided for. Permission was given also to deposit these funds in banks not members of the Federal reserve system in case there are no member banks in the locality willing to receive them upon the terms fixed in the law. On June 30 there were in the United States and territories, 7,-

701 postal-savings stations, with 603,000 depositors and $86,000,000 deposits. The volume of deposits has been increasing very rapidly and the rate of increase was stimulated by the above amendments. Eight post offices have each more than a million deposits, aggregating 42 per cent. of all; 58.7 per cent. of the depositors were foreign-born and own 71.8 per cent. of the deposits; natives of Russia lead with 20.7 per cent. This growth of postal deposits has caused a heavy demand for high-grade municipal and territorial bonds as a basis for collateral for postal funds. (See also XX, *The Post Office.*)

Farm Loan Banks.—To supplement the rural-credit clauses of the Federal Reserve Act, Congress enacted the Hollis-Bulkley rural-credits measure, officially described as "a measure to provide capital for agricultural development, to create a standard form of investment based upon farm mortgages, to equalize rates of interest upon farm loans, etc." The Farm Loan Act creates a Federal Farm Loan Board, composed of the Secretary of the Treasury and four others, and provides for the establishment of at least 12 Federal land banks under control of the Farm Loan Board, and an unlimited number of joint-stock land banks and coöperative farm-loan associations. Loans to farmers will be made on mortgages indirectly through these latter or through special agents, at rates fixed by the Farm Loan Board; the mortgages may be pledged by the regional banks to secure bonds issued by the Secretary of the Treasury, Comptroller of the Currency, and the Farm Loan Board jointly; and such bonds are made lawful investment for public and trust funds, funds of the Federal reserve banks, and for securing deposits of government money. The Board was still engaged in organizing the system at the close of the year. (See also XVII, *Agriculture.*)

Effects of the War.—The European War has greatly influenced the banking and currency situations, particularly through the immense balance of trade and through loans placed in the United States by belligerent and neutral nations. For the year 1915 and the first nine months of 1916, the total of our exports was 3,555 and 3,949 millions, respectively, and the trade balances 1,776 and 2,118 millions, respectively (see also XIII, *Economic Conditions*). The rates of foreign exchange have continued low, and the problems of 1915 (*A. Y. B.*, 1915, p. 372) have simply been extended. Foreign financiers have reluctantly parted with immense quantities of gold and Americans have reluctantly received it. In the year 1915 the imports of gold into the United States totaled 451 millions, and for the first ten months of 1916 the net increase in the country's gold holdings was approximately 400 millions (see *ibid.*). The United States has produced during the year about 100 millions of gold. From these two sources our gold supply has been increased by one-third, that is, by probably three-fourths of a billion, until we now hold about 2.5 billions, practically the same as all the Allies combined and four times Germany's lot. The first result has been an increase of prices. Bradstreet's average index numbers of 107 comparative wholesale prices on the first day of each calendar have been as follows: 1914, $8,9034; 1915, $9,8530; 1916, $11,8251 (see *ibid.*). The vast gold imports have poured into the bank reserves, made money very easy, and promoted the wildest speculation on the stock and produce exchanges (see *ibid.*). In these extraordinary conditions the Federal reserve system has been more easily established, for the plenitude of funds has made such operations as the shifting of reserves very easy, and has given the Federal Reserve Board opportunity to correct the minor imperfections leisurely and not under panic stress. But it has shown itself incapable of handling such immense additions of gold in such a way as to prevent a nearly equal increase in the money supply, and it has defeated the necessity for rediscounts and the real test of capacity to provide an elastic or emergency currency. The gold supply has brought to the front the proposal to retire the greenbacks, since it would reduce the inflation by 196 millions; the Board and the American Bankers' Association have been working to that end. Much of the gold

has been carried to the Government and exchanged for gold certificates. From Oct. 1, 1915, to Oct. 1, 1916, the gold certificates in circulation increased from 1,172.3 millions to 1,520.7 millions, or 350 millions. A law was passed permitting the Treasury to hold two-thirds instead of one-third of this gold in bullion instead of coins. The Federal reserve notes in circulation are practically gold certificates, for against 215.2 millions issued the Federal reserve banks hold 184.2 millions in gold. This condition has come about by a roundabout process, the rediscount of paper, the presentation of the paper as collateral for note issue to the bank, the exchange by the bank of notes for gold, and the redemption of the paper in the hands of the reserve agents with gold. The result is the accumulation of gold in the Federal reserve vaults, reducing somewhat the gold inflation and providing potential strength by way of large reserves. The Board sought legislation to permit direct issue of Federal reserve notes for gold, but the bill, after passing the Senate, was lost in the House. The situation has led to two new movements, (1) to let Federal reserve notes be used as part of member bank reserves, and (2) to stop the issue of gold certificates. The foreign-trade expansion has had the further effect of making New York the greatest money center, and forcing American banks into the foreign banking field. The foreign acceptance business is developing (see *Federal Reserve System, infra*). Some of our biggest banks are establishing branches in South America and Europe, and provision has been made for the joint ownership of foreign branches by member banks (see *ibid.*).

Another effect has come by way of loans to belligerents and neutrals. To overcome the handicap of adverse rates of exchange the Allies have released much gold, established private banking credits, and pledged mobilized American and other securities as collateral for loans. American securities have come back to us in huge quantities (see also XIII, *Economic Conditions*). The character of these loans may be presented by two important ones. The French Government placed a loan of 100 millions through a syndicate, the American Securities Co., organized for the purpose of loaning money to foreign governments; against this loan the Company is selling $94,500,000 of its own three-year, five per cent. notes at 98. The French Government pledged $113,449,000 (market price) of neutral governments' bonds as collateral, and agreed to keep a margin of 20 per cent. to protect the Company. The British also placed a $250,000,000 loan here, Sept. 1, pledging American securities and bonds of neutral countries to the aggregate value of $300,000,000. The public offering was in two-year notes at 99 on a 5½ per cent. basis. This loan depressed the value of the Anglo-French bonds; they were selling down to 94½ @ ⅝ the first week of November. The following is an estimate of the total public loans to belligerent countries, including provinces and municipalities, since the war began:

	Millions
Great Britain	$858.4
France	706.2
Russia	167.2
Italy	25.0
Dominion of Canada	120.0
Canadian provinces and cities	185.0
Germany	20.0
Total	$2,081.8
Less amount paid off	156.4
	$1,925.4

Meanwhile other loans have been made to the neutral European countries and to Latin America and China, to the amount of about 150 millions.

The British Government has financed itself during the war in large part by short-term treasury notes (see IV, *The United Kingdom*). In November some American financiers offered some of these British notes for sale in the New York market. The Federal Reserve Board issued to the public by way of the press a statement of its position with respect to purchases of these by banks in this country, and opposed such purchases on the grounds: (1) that they were not necessary, since other expedients were at hand to prevent the large importations of gold from proving a source of danger; (2) that the banks should pursue a policy of keeping

themselves liquid and not lock up their funds in long-term obligations or short-term obligations which either by contract or through force of circumstances would have in the aggregate to be renewed until normal conditions returned. This action of the Board occasioned much public comment; the banking world is divided as to the expediency and as to the propriety of manner of interference by the Board; but Great Britain relieved the situation by withdrawing the Treasury notes from the American market.

Banking Legislation.—Congress enacted during the year a number of important amendments to the Federal Reserve Act which are reviewed in a subsequent section (see *Federal Reserve System, infra*). Besides these amendments, after years of effort on the part of chambers of commerce and the American Bankers' Association, Congress passed the Pomerene Bills-of-Lading Act establishing the carriers' liability for bills of lading issued by authorized agents and making them as safe as warehouse receipts as evidence of the possession of and responsibility for goods. It makes the carrier liable to a *bona fide* consignee or banker who pays or loans money upon a bill of lading issued by an authorized agent, although no goods in fact have been received. It also gives full negotiability to bills of lading, and so affords greater protection to the discounting banker and to the buyer of the goods; and, further, makes the person criminally liable who forges a bill of lading and the agent who issues a bill that does not represent goods. This legislation is most opportune with respect to our new banking uses of commercial paper in foreign and domestic trade. (See also XX, *Railroads.*)

The report of the law committee of the American Bankers' Association in June cited the following legislation, recommended by the Association, as passed by the legislatures in session in 1916: (1) the Negotiable Instruments Act by Mississippi; (2) the Uniform Stock Transfer Act by New Jersey; (3) the Check Without Funds Act by Mississippi and by Rhode Island.

Apart from these acts the volume of important state legislation was small. Georgia enacted an acceptance act and a usury act, the latter making the penalty forfeiture of the entire interest. Virginia also enacted an acceptance act. Kentucky prohibits banks from declaring dividends until their surplus equals 10 per cent. of their capital. Massachusetts empowers trust companies to accept drafts and bills and to issue letters of credit; permits deposit of trust funds in trust companies incorporated under state laws; and limits and provides for increase in the capital stock of trust companies. Oklahoma fixes the legal rate of interest at six per cent. and the contract rate at 10 per cent.

FEDERAL RESERVE SYSTEM

The Federal Reserve Banks.—A consolidated statement of the 12 Federal reserve banks at the end of October of 1915 and 1916 is given below:

	Week Ending Oct. 28, 1916	Week Ending Oct. 26, 1915
RESOURCES:	"millions"	"millions"
Gold coin and certificates in vault	$274.0	$245.9
Gold settlement fund	122.6	73.8
Gold redemption fund with U. S. Treasury	1.4	1.2
Total gold reserve	$397.9	$320.9
Total reserve	407.9	358.3
Bills discounted and bought	$117.2	$48.8
Investments:		
United States bonds	40.5	12.9
One-year U. S. Treasury notes	11.4	
Municipal warrants	29.9	27.3
Total earning assets	$189.0	$40.2
Federal-reserve notes, net	$16.8	$19.2
Due from Federal reserve banks, net	33.2	14.1
All other resources	3.7	4.6
Total resources	$651.1	$485.3
LIABILITIES:		
Capital paid in	$55.7	$54.8
Government deposits	29.9	15.0
Member bank deposits	551.9	397.9
Federal-reserve notes, net	11.9	13.4
Federal-reserve bank notes out	1.0	—
Total liabilities	$651.1	$485.3

The following table shows the distribution of gold reserves, discounts, and deposits among the 12 banks during the week ending Oct. 28, 1916:

Bank of	Total Gold Reserve (millions)	Bills Discounted and Bought (millions)	Member Bank Deposits (millions)
Boston	$24.9	$10.9	$39.2
New York	178.2	25.6	216.0
Philadelphia	21.4	12.7	34.1
Cleveland	27.8	7.1	42.2
Richmond	23.2	5.6	19.6
Atlanta	6.9	6.8	12.2
Chicago	49.3	9.4	74.0
St. Louis	11.4	7.8	23.7
Minneapolis	10.9	5.6	20.1
Kansas City	15.8	3.0	26.6
Dallas	14.1	3.9	16.9
San Francisco	14.1	8.6	26.5

Earnings.—The combined 12 Federal reserve banks from January to June, 1916, show $1,824,436 earnings and $1,019,926 current expenses, earning a surplus of 2.9 per cent. upon the total paid-in capital of $54,854,000. The St. Louis bank alone failed to earn its current expenses. The highest earnings were made by the banks at Dallas, Richmond, Kansas City and Atlanta, and these four, with Chicago, have declared dividends. The low earnings are explained by the character of the investments open to the banks, being limited to bankers' acceptances, bills of exchange, municipal warrants and government bonds, all of which are very liquid but bear low profits. During this period 26.3 per cent. of the 12 banks' combined earnings came from rediscounts, 24.7 per cent. from U. S. bonds and notes, 23.4 per cent. from bills bought in open market, and 19.6 per cent. from municipal warrants.

Bond Conversions.—The process of bond conversion was begun in February, when the Secretary of the Treasury announced that he had decided to convert bonds which might be offered up to $30,000,000 into equal amounts of 30-year, three per cent. bonds and one-year gold notes without the circulation privilege, the actual conversion dating from Dec. 31, 1916. The applications have exceeded the maximum limit for the retirement of national bank notes per month. The Federal reserve banks have an unlimited right to buy United States bonds in open market, and such purchase, by ruling of the Federal Reserve Board, may be deducted from the number which the Board may force the Federal reserve bank to buy. By the end of October, the Federal reserve banks held 40 millions in bonds and 11 millions in one-year notes, and the national-bank note circulation had fallen 50 millions. The purchasing bank may keep the two per cent. bonds with the note issue privilege and put out the new currency Federal-reserve bank notes, but this privilege was used for only between one and three millions, partly because the notes are not favored by the Board and partly because the United States three's and four's are now at from two to 12 per cent. premium.

Discounts and Rediscounts.—The volume of rediscounted bills has been small, due to the scarcity of rediscountable paper and to the influx of gold into bank reserves, enabling banks to care for demands at low rates without resorting to rediscounting. Up to Oct. 26, of the 107 millions of rediscounts, the New York bank had rediscounted 25.6 millions, Philadelphia, 12.8 millions, and Boston, 10.9 millions, and the rest had averaged about 6.5 millions. The Federal reserve banks accommodated between 500 and 900 of the 7,600 member banks by rediscounts each month, and the amount out at any one time ranged between 25 and 30 millions. Taking the first eight months of 1916, the commercial papers bought were distributed as follows: commercial paper exclusive of open-market purchases, 100.1 millions; trade acceptances, 2.2 millions; commodity paper, 10.4 millions; acceptances in the foreign and domestic trades bought in open market, 192.6 millions. The average holdings of bankers' acceptances bought in open market rose consistently from 25 millions to 75 millions per month, but trade acceptances fluctuated between one million and 4.3 millions. The Board has continued its campaign favoring bank and trade acceptances. On Dec. 4, 1915, it issued regulations for the purchase and sale of cable transfers and bills of exchange, both domestic and foreign, of the kinds eligible for rediscount, and

bankers' acceptances payable in foreign countries and currencies (see also *Banking Legislation, infra*). Our relatively low discount rates and high and secure dollar exchange favors the rise of the bankers' acceptance here. The war has forced the establishment of a great many export dollar credits through American banks. Dollar exchange is a reality, and quotations are made in it in South America and oriental countries.

Reductions of Capital and Reserves.—One effect of the low earnings of the Federal reserve banks has been to occasion a movement to reduce or abolish the capitalization of the banks and return it to the member banks. The McFadden bill (H. R. 14227) was presented to Congress to this end; the Federal Advisory Council is divided on the question. The Federal Reserve Board has ruled that the initial minimum capital of four millions as a condition precedent to commencing business is not a continuing requirement, and the capital of the bank may fall below that amount. A substitute proposal has been to reduce the number of districts, but the right of the Board to abolish a district or change a Federal reserve city has been denied (*A. Y. B.*, 1915, p. 369), although under its power to "readjust" districts the banks of Fairfield County, Conn., were taken from Boston and given to New York, and certain southern Louisiana banks were taken from Dallas and given to Atlanta. Low earnings of the regional banks have encouraged also the movement to stop the shifts of reserves from correspondents in reserve cities and central reserve cities to Federal reserve banks as rquired under the Act. The regular half-year shifts take effect on May 16 and Nov. 16, and the members lose the two per cent. interest on their deposited reserves. The member banks have pushed a legislative campaign either to reduce the reserve requirements or to permit their deposits with correspondents to count as part of their reserve, that is, to relieve them of further payments to the Federal reserve banks for reserve purposes. The Pomerene and McFadden bills were to this end. The Federal Reserve Board has opposed the plan, for it would perpetuate the system of pyramided reserves, and the old check-collections and exchange-charge systems, with their train of evils—interest on deposited reserves, speculation at reserve centers, the giving of immediate credit for out-of-town checks and counting the "float" as reserves. The Federal reserve banks have resources too limited to warrant them in carrying 300 millions of "float." The increased loaning power to the member banks by release of the reserves under the Federal reserve system is some compensation for the loss of interest on reserves. The Board has been anxious to concentrate the gold in the Federal reserve banks, and urged the members to carry as little as possible in their own vaults (see *Banking Legislation, infra*).

Par Collections.—This question of reserves is inextricably bound up with the new par-collection system introduced on July 15; an intra-district voluntary reciprocal system was effected in 1915 (*A. Y. B.*, 1915, p. 370). On July 15 each Federal reserve bank began to receive at par from its member banks checks drawn on all member banks, whether in its own or another district, and also checks on non-member banks where they can be collected at par. All member banks are required to remit for their own checks at par, but where it is necessary to ship lawful money to meet balances it may be done at the expense of the Federal reserve bank. Checks remitted will not count as reserve or be subject to check until collected. The actual cost of collections will be charged back to members upon the basis of volume of business handled. The system is voluntary, and it will not necessarily supplant local or other existing clearing arrangements. Banks joining the system must keep with the Federal reserve bank a sum in addition to its reserve sufficient to provide for debiting these checks against its account. Since the plan cuts off interest on reserves and profits from collection charges, the country banks have strenuously fought the introduction of the system. During the first month of the par collections system the average number of items handled daily was 133,112, totaling 59.3 millions,

for 7,624 member banks and 7,032 state banks remitting at par. During the second month the figures were 177,397 items, 78.5 millions, 7,618 member banks and 7,449 state banks remitting at par. This represents an increase of considerable amount in every respect and indicates a rapid tendency toward making the system universal. The Federal reserve bank at New York is making collections at a cost of one cent per item. This cost will decrease as the volume of checks increases and cuts the overhead charges. The Boston bank now collects for all member and non-member banks in the district at par. Balances as between Federal reserve banks are adjusted through the Gold settlement fund (*A. Y. B.*, 1915, p. 370). During the first year of its operation, about 2.25 billions were settled through this fund by an actual change of ownership of gold of only 6.62 per cent. of the settlements; they rose from 20 to 80 millions per week; for the week ending Aug. 24, reaching 104 millions. The volume of bank clearings in the United States have increased tremendously during 1916; for the week ending Oct. 11, New York clearings gained over the corresponding week of 1915, 37.3 per cent., Boston, 37.6 per cent., Philadelphia, 45.9 per cent., Baltimore, 2.6 per cent., Chicago, 35.6 per cent., St. Louis, 45.7 per cent., and New Orleans, 66.4 per cent. (see also XIII, *Economic Conditions*).

Amendments to the Federal Reserve Act.—Besides the legislation noted in the foregoing discussion, the following amendments to the Federal Reserve Act have been passed by the Sixty-fourth Congress:

(1) Permitting member banks to subscribe an amount not exceeding 10 per cent. of their capital and surplus to the stock of one or more banks organized to do business principally in foreign countries.

(2) Giving member banks a right to accept drafts drawn by foreign banks upon not more than three months' sight in dollar exchange; and drafts of not more than six months which involve the shipment of domestic goods, provided the warehouse receipts and shipping documents be attached; to rediscount such acceptances when they mature in not more than three months; and limiting the amount to which a bank may accept in direct trade transactions, foreign and domestic, to 50 per cent. of its capital and surplus and allowing a like amount additional in exchange transactions; and also limiting the amount of such acceptances for any single concern to 10 per cent. of its capital and surplus.

(3) Permitting member banks in towns not exceeding a population of 5,000 to act as agents for insurance companies authorized to do business in the state, and to act as agents placing loans on real estate located within 100 miles of the bank.

(4) Liberalizing slightly the right of national banks outside the central reserve cities to loan on real estate.

(5) Authorizing the Federal reserve banks to make advances to member banks for not more than 15 days, on the security of notes, drafts, bills of exchange, or acceptances eligible for rediscount without actual sale of the paper.

(6) Authorizing the Federal Reserve Board to permit member banks to carry in the Federal reserve bank of their respective districts any portion of the reserves required by Section 19 of the Act to be kept in their own vaults.

(7) Allowing the Federal reserve banks to use the paper acquired in open-market transactions as security for issues of Federal reserve notes the same as that obtained by rediscounting.

(8) Softening the "interlocking-directorate" provisions of the anti-trust acts so as to permit interlocking directorates among banks not in substantial competition, but requiring permission to be had from the Reserve Board by anyone wishing to serve on two boards.

INSURANCE

LIFE INSURANCE

WENDELL M. STRONG

General.—The abounding prosperity of large classes of the community during the year 1916 is mirrored in the unexampled expansion of life insurance. Without complete statistics available, it is still safe to say that the year will show much the largest amount of new business issued of any year since the beginning of insurance in this country. In 1916 we have probably the culmination of the tendency which began even before the end of 1914. With the beginning of the war in 1914, the business of the country was apparently prostrated, and the amount of insurance being written dropped. The recovery, however, began before the end of the year, and continued and gathered impetus throughout 1915, so that 1915 considerably surpassed in amount issued

any previous year, and 1916 has, without question, greatly surpassed 1915. An indication of the result appears in the fact that two of the large companies have been compelled, before Nov. 1, to notify their agents that they are approaching the legal limit which, under the laws of New York State, they may write within the year.

New Business Problems.—An unexampled increase in business done does not mean prosperity to life insurance in the way that it would to most other kinds of business. This is because the heavy expenses of life insurance are the initial expenses, that is, the expenses connected with the selling of new policies. Besides the commission which it is necessary to pay, there are the medical and investigation expenses, together with the considerable expenses in the home office of passing on the applications, writing the policies, bookkeeping, etc. The first premium on the policy, however, is the same as subsequent premiums, and in the classes of policies most largely issued this first premium is not sufficient to pay these expenses and the carrying the risk for the year. Furthermore, it is not until a policy has been quite a number of years in force that accounts balance with regard to that policy, when dividends, if the policy is participating, and the legal liability of the reserve are taken into consideration. This means that with the increase in the amount of insurance written, money must be advanced either from capital or surplus which will be returned wholly only after a period probably lying between five and ten years. In a stock company this can be met, if the increase of business is too rapid for the present capital, by an increase of capital; in a mutual company (and most of the large companies are mutual, the one exception among the largest companies being, with its capital stock of only $100,000, in practically the same position as a mutual company), the only place for such temporary borrowing is from the surplus, and if the borrowing is too large, the surplus will be reduced below what it should be, and it would be theoretically possible for a company, by its very prosperity, in adding to its new business, to exhaust its surplus entirely and show a technical deficit. While even in this case what was loaned would eventually all come back, it would necessarily make trouble and be detrimental to the interest of the policyholders meanwhile. Thus, an increase in new business in life insurance is a blessing only up to some point beyond which it should not go. Because of this peculiar condition of affairs, New York State has placed a legal limit, resulting from a somewhat complicated calculation, on the amount which can be written in any one year, which limit applies to all companies doing business in New York State and which varies according to the size of the company and amount of previous new business and the savings effected. This limit would prevent any of the larger companies from going to the extreme and writing in these exuberant times an amount of new business out of all proportion to what it should write for its best interests.

War Losses.—There was fear at the beginning of the war, principally by those not familiar with the real conditions, that heavy extra mortality might be caused by the war to companies doing business in the belligerent countries. The mortality occasioned by the war to the companies doing business in Europe has been, so far as the figures which are published or known show, surprising in its extreme smallness. It is possible to state the figures to date for the Mutual Life only, since recent figures for other companies which have done business in Europe have not been made public. At the beginning of the war the Mutual Life had in force in the countries at war (not including Canada) something over $160,000,000 of insurance. Its total death losses due directly or indirectly to the war, reported in the two years and three months from the beginning of the war to Nov. 1, 1916, have been about $825,000; in this were included the insurance on lives of persons who went down on the *Lusitania* and many cases only technically "war claims," and probably not due to the war, such as a clerk in the Berlin War Office who died from disease. When it is remembered that the actual loss was

STATISTICS OF UNITED STATES LIFE-INSURANCE COMPANIES
(*Insurance Year Book*)

Year	Number of Companies	End of Year		Premiums Received[2] (millions)	Total Income[2] (millions)	Total Payments to Policyholders[2] (millions)	Total Disbursements[2] (millions)	New Business[3] (millions)	Amount in Force at End of Year[3] (millions)
		Admitted Assets[2] (millions)	Surplus[1] (millions)						
1915	235	$5,190	$663	$784	$1,042	$544	$767	$2,643	$18,351
1914	250	4,940	665	748	988	510	708	2,507	17,381
1913	259	4,658	624	715	925	468	659	2,533	16,588
1912	248	4,407	621	672	893	447	628	2,405	15,559
1911	239	4,163	603	632	834	414	569	2,101	14,577
1910	211	3,874	557	593	779	387	540	1,846	13,233

[1] Includes amounts set apart for dividends to policy holders during following year. [2] Includes industrial business in 27 companies. [3] Does not include industrial business.

SURRENDERS, LAPSES, LOANS, AND DIVIDENDS [1]
(*New York State Report*)

Year	Number of Companies	Amount in Force, End of Year (millions)	Amount of Policies Surrendered (millions)	Amount of Policies Lapsed (millions)	Policy Loans End of Year (millions)	Dividends to Policyholders (millions)	Amount Paid for Surrendered Policies (millions)
1915	35	$15,632	$390	$433	$691	$106	$113
1914	35	14,9o3	362	427	657	104	102
1913	34	14,304	339	383	614	96	87
1912	34	13,o27	276	366	548	88	84
1911	34	12,802	252	325	507	80	75
1910	33	11,669	236	277	465	72	72

[1] Life companies reporting to State of New York only.

considerably less than the amount of the insurance, since a considerable reserve had accumulated, and when it is further considered that the Mutual Life normally pays death claims of nearly $25,000,000 a year (or over $50,000,000 within the time in question), it will be seen how comparatively unimportant the death losses due to the war may be.

Present Tendencies.—One of the tendencies of the year 1916 has been that of extending the life-insurance contract to cover, with more or less completeness, disability insurance also. In some cases the provision is that a life policy, in case of disability, shall be payable in ten equal annual instalments and an annual payment of the same amount shall continue to the insured as long as he lives and the disability continues. In such case there would be nothing payable at death if the ten instalments had been paid. Some companies have adopted a provision for paying during the disability of the insured one-tenth of the amount of the insurance each year and also for paying, at the insured's death, the full amount of the policy. It will be seen that such provisions are a very great broadening out from the strict life-insurance contract, to cover the loss of wage-earning ability as well as that of life itself. This is a most important extension of life insurance which has been gradually coming and which now seems to be so firmly established that no retrogression will take place.

Loans and Surrenders.—A glance at the accompanying tables shows that, while the amount of insurance in force, assets and dividends, increase from year to year, the surrenders and amount of policy loans unfortunately more than keep pace. The Year Book has already explained (*A. Y. B.*, 1912, p. 353; 1913, p. 368; 1914, p. 360) the waste caused by these sur-

UNITED STATES INDUSTRIAL INSURANCE COMPANIES

(*Insurance Year Book*)

Year	Number of Companies	New Business (millions)	Insurance in Force at End of Year		Premiums Received (millions)	Losses Paid (millions)
			Number of Policies (millions)	Amount (millions)		
1915	33	$973	33	$4,434	$254	$70
1914	31	861	31	4,163	237	64
1913	31	850	29	3,977	218	60
1912	31	840	26	3,707	199	53
1911	32	785	24	3,423	183	50
1910	22	749	23	3,179	171	47

renders and the way surrenders result from policy loans.

Modification of the New York Expense Limitation.—When the Metropolitan and the Prudential, the two largest non-participating companies, mutualized, they desired to retain the same premiums for participating policies they had used for non-participating and these contained only a small loading. The New York law, however, limited total expenditures to total premium loadings, and these companies consequently desired a change in this law. A modification was made in 1915 (*A. Y. B.*, 1915, p. 375) which increased the allowance on the business written before mutualization. This, however, did not give the relief desired and in 1916 the law regarding limitation of expense was again amended, to permit any company which changes from a stock company issuing only non-participating policies to incur a total expense in excess of the limit otherwise set, by six per cent. of the net premiums.

Emory McClintock.—One of the pre-eminent figures in life insurance passed away during the year, Emory McClintock, whose retirement from active service was mentioned in the YEAR BOOK for 1911 (p. 318). Successively actuary of the Northwestern Mutual, of the Mutual Life, and vice-president and actuary of the Mutual Life, he probably had as great an influence for the right development of life insurance in this country as any other one man. In his profession of actuary, he was a recognized leader, both as a scientific actuary and a practical insurance man, for over a generation. He stood also in the first rank of mathematicians of his time.

Industrial Insurance.—The history of industrial insurance, as considered separately from ordinary life insurance, has contained during the years 1915 and 1916 nothing of special interest. The statistics show a normal growth of this great branch of the life-insurance business.

Fraternal Insurance.—Among the most important events in fraternal insurance in more recent years are the questions connected with the raising of rates, either under the present ne-

UNITED STATES FRATERNAL ORDERS

(*Insurance Year Book*)

YEAR	Number of Orders	Assessments (millions)	Total Income (millions)	Claims Paid (millions)	Total Disbursements (millions)	Assets End of Year (millions)	New Business (millions)	Number of Certificates in Force, End of Year (millions)	Amount in Force, End of Year (millions)
1915	472	$122	$133	$98	$123	$212	$922	7	$8,694
1914	498	125	144	98	121	189	1,079	7	9,171
1913	509	129	144	101	121	183	1,065	8	9,622
1912	397	123	132	95	114	163	1,023[1]	9[1]	9,472
1911	396	117	130	84	113	148	1,200	10	9,839
1910	497	114	128	92	110	129	1,331	8	9,562

[1] Decrease as compared with 1911 is partly due to incomplete figures from some orders.

cessity of the orders or because it seems a wise provision for the future. In 1916 one of the largest of the fraternal orders and one with a most honorable history, the Royal Arcanum, was compelled to make a very considerable increase in its rates. This is having the usual result of the withdrawal of many members.

An inspection of the accompanying table of fraternal orders shows that the increase which is seen in ordinary life insurance is lacking in fraternal insurance, which has tended in recent years rather to retrogression. The reason for this is not far to seek when the facts with regard to the Royal Arcanum are noted and it is remembered that similar experiences are overtaking many of the fraternal orders.

PROPERTY AND CASUALTY INSURANCE

S. S. Huebner

Fire and Marine Insurance.—The number of fire and marine companies and Lloyds associations doing business in the United States during 1915 was slightly larger than during the preceding year, the total being given by the *Insurance Year Book* as 659, as compared with 633 in 1914, 645 in 1913 and 621 in 1912. The capitalization of these companies and associations totaled $107,674,000, an increase of slightly less than two per cent. as compared with 1914. The total assets of $888,700,000, however, show a very substantial increase, the gain in this item for the year being $60,513,000, or an increase of 7.3 per cent. This gain compares with 26 millions during 1914, 17 millions during 1913, 30 millions during 1912, 40 millions during 1911, and 45 millions during 1910. Net surplus amounted to $330,353,000, a gain over 1914 of $37,899,000, or nearly 13 per cent. This increase appears unusually large when we recall that the net surplus during 1914 showed a gain of only $1,262,000, and this in view of the fact that during 1913 there actually occurred a decline of $1,701,000. Even during the more favorable years of 1912 and 1911 the respective increases amounted to only 10 and 20 millions. As was explained for the year 1913 (*A. Y. B.*, 1914, p. 364), the shrinkage in surplus for that year, and the same may be said for 1914, was traceable in large measure to the extremely low range of security values which prevailed during the year. It was then indicated that there was reason to believe that the same unfavorable situation would not present itself at the close of 1915, owing to the material and continued rise in most security values. In conjunction with the increased value of securities held, however, should be mentioned the fact that fire losses during 1915 compare very favorably with 1914, the nation's fire waste amounting to only 183 millions, as compared with 235½ millions in 1914.

Net premiums and total income show increases during 1915 of $28,020,000 (nearly 7 per cent.) and $23,893,000 (over 5.4 per cent.), respectively. These figures compare with increases of $20,608,000 and $19,135,000 for 1914 as compared with 1913. Paid-for losses actually show a decrease of $1,348,000, whereas during 1914 such losses increased by $23,418,000. Total disbursements increased by only $9,635,000, as contrasted with $24,543,000 for 1914. Of the total disbursements the amount paid for losses constituted 54.3 per cent.; dividend payments 7.1 per cent.; and paid-for expenses slightly over 38 per cent. The respective ratios of these items to total disbursements in 1914 were 56 per cent., 8.3 per cent., and 35 per cent., and for 1913, 54 per cent., 92 per cent. and 37 per cent.

The *Insurance Year Book* for 1916 furnishes the data given on the next page for companies and Lloyds associations doing a fire and marine insurance business in the United States. The figures indicate a prosperous year for the business. A summary of the report of the New York Insurance Department for 1915 shows that 264 companies writing fire and marine insurance in New York State had aggregate assets on Dec. 31 of $783,013,000, an increase over those of the preceding year of 49,177,000, while their total liabilities, excluding capital, showed an increase of but $14,835,000. The report also shows that while the total income of $453,209,000 represents an increase of $27,225,000, the increase in total disbursements

FIRE AND MARINE INSURANCE COMPANIES

Year	Number of Companies and Lloyds	Capital (thousands)	Total Assets Exclusive of Premium Notes (thousands)	Net Surplus (thousands)	Net Premiums (thousands)	Total Income (thousands)	Paid for Losses (thousands)	Paid for Dividends (thousands)	Paid for Expenses (thousands)	Total Disbursements (thousands)
1915	659	$107,674	$888,700	$330,353	$433,995	$474,626	$226,867	$29,839	$159,568	$416,275
1914	633	105,670	828,187	292,454	405,975	440,733	228,215	33,786	144,638	406,640
1913	645	105,195	801,918	291,192	385,367	421,598	204,797	34,266	143,033	382,097
1912	621	96,944	784,478	292,893	371,626	410,760	190,073	32,526	136,738	359,338
1911	621	97,703	754,344	283,201	358,623	392,966	184,917	33,291	129,474	347,683
1910	628	94,918	713,138	263,867	352,436	385,657	168,433	35,905	124,878	329,218
1909	636	87,638	668,194	243,414	333,862	365,264	156,369	31,217	116,964	304,552

amounted to only $3,457,000, while loss payments actually declined by the large amount of $6,115,000. The total result of the year's operations is indicated by the extraordinary increase of $31,818,000 in the combined surplus of the companies from all sources. The *United States Review*, in commenting upon the record, concludes that:

> The figures show that in practically all of the items of material concern the gains made and the trade profits realized reached proportions quite unusual in the experiences of the last ten years or more. . . . One only needs to look at the record of the present year (1916) as far as it has gone to find warrant for the fear that the 1915 record was too good to be counted upon as a basis of steady future experience.

The following table shows the combined risks and premiums of American and foreign companies operating in the United States for the past ten years, as reported by the *Insurance Year Book:*

	Amount Covered (thousands)	Premiums Charged (thousands)	Rate per $100
1906	$32,278,524	$365,135	$1.1312
1907	35,375,319	402,874	1.1389
1908	37,155,734	417,671	1.1241
1909	39,951,263	442,415	1.1074
1910	43,123,801	464,616	1.0774
1911	46,276,992	491,072	1.0612
1912	48,840,386	514,594	1.0536
1913	52,856,280	544,836	1.0308
1914	56,012,859	570,687	1.0189
1915	58,867,095	588,701	1.0000

Aggregate combined risks of nearly 59 billions represent an increase for the year of slightly more than 5 per cent. The average rate per $100 of insurance is reported at $1.0000, as compared with $1.0189 in 1914, showing a continuation of the tendency, exhibited for many years, of the average rate to reach a lower level.

Fire Losses.—As already indicated, the favorable experience of fire-insurance companies during 1915 is largely traceable to the low fire loss. Total losses for the year, as compiled by the *Journal of Commerce and Commercial Bulletin*, aggregated only $182,836,200, as compared with $235,591,350 for 1914 (a decrease of over 27 per cent.), and an average annual loss for the five-year period, 1910-1914 inclusive, of $230,889,000. In commenting on such an extraordinary decline the superintendent of insurance of New York State reports that "it is not perhaps too much to infer that the persistent and widespread activity of the constantly increasing number of fire prevention organizations had its influence and effect." Despite the favorable showing, however, we should not lose sight of the great difference in the fire loss *per capita* in the United States as compared with that experienced in leading European countries. Thus, in 1915 the *per capita* loss in the United States (estimating the population at 101,073,000) amounted to approximately $1.81, as compared with a *per capita* loss for England of $1.03, for France of $1.02, for Germany of 49 cents, and for Italy of 62 cents. An examination of the *per capita* loss for 326 American cities (reported in the *Insurance Year Book*) shows that in 68 the *per capita* loss during 1915 was over $3, in 48 over $4, in 24 over $5, in 18 over $6, in 11 over $7, and in eight between $8 and $28. (See also VII, *Fire Prevention.*)

During the first nine months of 1916, fire losses unfortunately averaged much higher than during the corresponding period of 1915, the losses totaling $171,799,845, as compared with only $126,288,400 for the same period in 1915, an increase of $45,511,445 or nearly 34.5 per cent. This recent experience indicates the correctness of the statement already referred to, that "one only needs to look at the record of the present year as far as it has gone to find warrant for the fear that the 1915 record was too good to be counted upon as a basis of steady future experience." The following table, compiled by the *Journal of Commerce and Commercial Bulletin*, shows the fire losses in the United States for the past five years:

FIRE LOSSES

	1912	1913	1914	1915	1916
January	$35,653,450	$20,193,520	$23,204,700	$20,060,600	$21,423,350
February	28,601,650	22,084,600	21,744,200	13,081,250	24,770,770
March	16,650,850	17,511,000	25,512,750	18,786,400	38,680,250
April	16,349,400	16,738,250	17,700,800	18,180,350	12,681,050
May	21,013,950	17,225,850	15,507,800	11,388,450	15,973,500
June	16,103,450	24,942,700	29,348,000	10,893,950	12,247,500
July	15,219,100	20,660,900	17,539,800	9,006,800	23,013,800
August	14,158,800	21,180,700	11,765,650	10,067,100	10,745,000
September	13,779,300	17,919,300	14,383,050	14,823,500	12,244,625
October	13,651,650	14,932,750	14,004,700	14,465,850	17,701,375
November	16,172,300	15,207,600	21,372,750	21,204,850	19,898,450
December	17,967,000	16,126,450	23,507,150	20,877,100	22,063,325
Total	$225,320,900	$224,723,350	$235,591,350	$182,836,200	$231,442,995

The Laney-Odom Law.—No other event in the field of fire insurance during the year has been the subject of so much editorial comment in the insurance and financial press as the Laney-Odom Fire Insurance Act passed at the 1916 session of the South Carolina legislature and declared constitutional by the state Supreme Court on May 1. Ignoring the experience of Missouri and Kentucky with similar legislation, South Carolina enacted a drastic law which undertook "to prevent fire-insurance companies or associations or partnerships doing a fire-insurance business in this state to enter into any compact or combination with any other insurance companies, associations or partnerships for the purpose of governing or controlling rates." All companies engaged in business within the state were obliged to file on March 1, 1917, and annually thereafter, an affidavit to the effect that "the company of which he is an officer or agent, has not in the 12 months previous to the date of the said affidavit, entered into any trust, combination or association, for the purpose of preventing competition in insurance rates." Any false statement was made punishable by a fine and imprisonment. The insurance commissioner was empowered (1) to revoke the license of any company failing to comply with the provisions of the law, and following official revocation, no renewal of authority could be granted for a period of three years; and (2) to review rates with a view to determining whether they are discriminatory or unjust. The law also forbids "any difference or distinction in rates or in methods of payment of premiums or in any other way whatsoever" upon risks of like hazard.

Considering the harsh terms of the Act impracticable and unendurable, nearly all the companies doing business in the state decided to withdraw, following the course pursued in Missouri and Kentucky. According to published accounts the total insurance in force in South Carolina of the retiring companies at the time of withdrawal amounted to about $250,000,000, while that carried by the remaining companies aggregated only about $19,000,000. Moreover, David B. Henderson, an insurance broker, representing the Liverpool & London & Globe Insurance Co. of England, alleged the unconstitutionality of the Act and petitioned the state Supreme Court to enjoin the attorney-general

and the insurance commissioner from enforcing the law. Among other points the petition contended "that the exemption of the mills mutuals and factory associations is an unjust discrimination," and "that both legislative and executive powers are conferred on the insurance commissioner." The Court overruled all the contentions of the petition, including the two last mentioned. It took the position, to quote the opinion, that "the duties of the insurance commissioner are not legislative or judicial, but merely ministerial, and the right of the state to review insurance rates is not in issue"; and further, that "the constitution requires the legislature to enact laws to prevent agreements against the public welfare. The legislature must primarily determine what agreements are against the public welfare." In view of this decision, the hope is now freely expressed that South Carolina may follow in the footsteps of New York, Pennsylvania, and various other states, and legalize fire-underwriters' associations, at the same time, however, placing them under strict governmental regulation.

Insurance Brokers' License Act Declared Constitutional.—Another event in fire insurance which has been the cause of much discussion during the year was an act passed in South Carolina on March 2, entitled "An Act to provide for the licensing of insurance brokers." One section of this Act provided that "only such persons be licensed as are residents of this state and have been licensed insurance agents of this state for at least two years." In dismissing the application of Philip La Tourette of New York for a license to do an insurance business in South Carolina under the Laney-Odom Act, the Supreme Court of South Carolina held that only those may be licensed who are residents of the state and have been licensed insurance agents for at least two years. The decision grew out of mandamus proceedings brought against the insurance commissioner by the state warehouse commissioner, who sought the issuance of a broker's license to La Tourette in furtherance of his attempt to obtain insurance for cotton stored under his charge. The complaint alleged that the law, in prohibiting the issuance of a license to non-residents, was opposed to the constitutions of both the state and the United States. Quoting the extended review of the case by the *Commercial and Financial Chronicle:*

> The Supreme Court in its opinion contends that the sole question is as to whether the provision in question is void on the ground that it discriminates against citizens of other states in favor of the citizens of South Carolina in violation of Section 2, Article 4 of the Federal Constitution. The opinion sets out the differentiation between "citizens" and "residents" of the state and seeks to show that under the provision in dispute citizens of the state are granted no privileges by reason of citizenship alone that may not be as freely enjoyed by the citizens of any other state upon the same terms and conditions.

Insurance Business for Banks.—In June the Comptroller of the Currency submitted a proposed amendment to the Federal Reserve Act, entitled "An Act to extend the corporate powers of national banks located in places without exceeding 3,000 population." According to this amendment about 2,000 national banks would be enabled to enlarge their activities by acting as agents for the placing of fire and life insurance and for the placing of real estate and farm loans in their localities. Provision is made to the effect that a bank may receive for soliciting and selling insurance such fees or commissions as may be agreed upon between it and the insurance company for which it may act as agent.

Marine Insurance.—Despite great fluctuations in the hazard, owing to war conditions, the marine branch of the insurance business continued during 1915 the satisfactory progress reported for the preceding year (*A. Y. B.*, 1915, p. 381). The extent of this progress may be judged by the showing of the 32 marine-insurance companies reporting to the Insurance Department of New York State, although it should be noted that a considerable number of fire-insurance companies also write marine risks. According to the New York report, the 32 companies had marine risks in force at the close of 1915 of $858,936,149, an increase of 162½ millions (nearly 23.3 per cent.) over the total volume of insurance outstanding at the close of 1914. This high increase

may be contrasted with that of only $678,000 in 1914 over the total at the close of 1913. Premiums received increased from $20,286,417 to $28,013,171, or over 33 per cent. Paid losses, however, unlike 1914, showed the large increase of 33 per cent., from $10,032,695 to $13,399,492. Total income increased during the year from $25,514,076 to $33,831,485, or 13.2 per cent. Despite the great increase in paid losses, the net surplus of the companies increased from $18,540,151 to $21,671,485, or nearly 17 per cent. The net surplus increased in 1915 from $16,245,643 to $18,540,151, or slightly over 14 per cent.

War Risk Insurance.—Previous issues of the YEAR BOOK have referred to the law enacted by Congress on Sept. 2, 1914, as a result of the European War, which created a Federal Bureau of War-Risk Insurance with a fund of $5,000,000 for a period of two years, designed to insure American vessels, freight and cargo whenever it proved impossible to secure adequate war-risk insurance elsewhere on reasonable terms (*A. Y. B.*, 1914, p. 368; 1915, p. 381). The results of this attempt of the Government to participate in the marine branch of the insurance business have proved exceedingly profitable to the Government and apparently highly satisfactory to the shipping community. According to late reports, the Bureau of War Risks, during its existence of nearly two years has yielded a net profit to the Treasury Department of $2,237,859, and in August reductions in rates were made on several classes of insurance for American vessels and non-contraband cargoes. Over 1,500 policies, representing $141,415,302 insurance, have been written; known losses total $771,329, and of this amount $58,811 has been recovered in salvage. Mention should be made also of the fact that the Maritime Association of the Port of New York has requested Congress to extend the life of the Bureau for another two years. In his communication to Secretary McAdoo, making the request, President Morrell of the Maritime Association states that:

> While the establishment of this Bureau was intended as an emergency measure, in view of the prolonging of the European War, we feel that conditions are such as to make the continuance of the Bureau most desirable after the expiration date. . . . Our board of directors believes that the continuance of the War Risk Bureau by facilitating the placing of risks and by its effect on insurance rates will be most helpful to our growing merchant marine, and will place our vessels in a favorable position to compete with foreign vessels, which are granted similar protection by their various Governments.

Liability and Compensation Insurance.—The extent of employers'-liability and workmen's-compensation insurance is indicated by the premiums written and losses paid by 42 companies writing liability contracts and 40 companies transacting workmen's compensation insurance. According to the *Insurance Year Book*, the liability premiums of these companies for 1915 amounted to $35,537,231, and the losses paid to $22,262,841; the ratio of losses to premiums was 62.6 per cent. On workmen's-compensation policies the premiums amounted to $31,348,758, the losses to $15,603,464, and the ratio of losses to premiums was 29.9 per cent.

In the YEAR BOOK for 1915 (p. 382) was presented a discussion of the rapidity with which the old system of employers' liability for negligence is being supplanted by laws providing for automatic compensation for injuries. At the close of 1914, it was stated, 23 states had adopted such laws, and during 1915 ten more states and territories were added to the list. To quote Mr. Edwin W. De Leon's review in the 1915 *Insurance Year Book:*

> There are now 31 states with compensation laws in addition to Alaska and Hawaii, the Canal Zone and the Philippine Islands, and the Federal laws. The legislature of Utah provided for a commission to prepare the draft of a law and report to the next legislature. The Idaho legislature passed a law in both houses which was vetoed by the Governor. The Missouri commission, appointed in 1913, reported a law, as well as a bill, for an Industrial Commission, but neither of these was enacted.

Kentucky, where the workmen's-compensation law was declared unconstitutional in December, 1914, it may be added, reënacted another law in March, 1916, providing for an elective system of compensation. (See also XVI, *Labor Legislation.*)

In addition to the foregoing, the following five important events should be noted in this field of insurance:

(1) The decision of the Pennsylvania Supreme Court in June, 1916, upholding the constitutionality of the Workmen's Compensation Act passed in 1915.

(2) The decision of the Court of Appeals of New York State in November, 1915, holding that the New York workmen's-compensation law applies to employees of railroads engaged in interstate commerce until such time as the Federal Government enacts a workmen's-compensation law.

(3) The adoption of a Federal workmen's-compensation law in September, 1916, which supersedes all existing laws relating to the compensation of injured Federal employees. The act makes provision for disability or death of civil employees of the United States resulting from personal injury sustained in the performance of duty. Two-thirds of the monthly pay at the time of injury (the total not to exceed $66.67 a month nor to be less than $33.33 unless the monthly pay is smaller) is allowed as compensation. Partial disability is compensated for at two-thirds of the difference between the monthly pay at the time of injury and the monthly wage-earning capacity following the accident, the total, however, not to exceed $66.67 a month. (See also XVI, *Labor Legislation.*)

(4) The meeting of the Joint Conference on Workmen's-Compensation Insurance Rates in New York in September and December, 1915. At this conference were representatives of the Workmen's-Compensation Service Bureau, the Massachusetts Rating and Inspection Bureau, the Compensation Inspection and Rating Board of New York and the insurance departments of California, Maryland, Massachusetts, New York and Pennsylvania, as well as the Industrial Commission of Wisconsin. The object of the conference was to discuss methods of compiling experience and of constructing rates, and represents the beginning of coöperation by agencies throughout the United States in the construction of scientific compensation rates.

(5) The attention devoted by the National Convention of Insurance Commissioners during 1915 to the subject of liability and compensation loss reserves. The work of the Convention's committee on reserves other than life is explained in the last report of the superintendent of insurance of New York State. "Indications are," according to this report, "that the committee will be prepared to make definite recommendations to the National Convention for new legislation in order that a bill, approved by the Convention, may be prepared in time for submission to the 1917 legislatures."

Accident and Health Insurance.—The following table, compiled from the *Insurance Year Book*, shows the premiums, losses, and loss ratios in the accident- and health-insurance business for the past eight years. Accident premiums written by 106 companies during 1915 totaled $36,977,988, an increase of only $453,176 over 1914, while the ratio of losses to premiums increased from 44.7 to 46.6 per cent. In health insurance the premium income of 49 companies writing health insurance separately totaled $7,891,030, an increase of $296,190.

ACCIDENT AND HEALTH INSURANCE

	Accident Insurance			Health Insurance		
	Premiums	Losses	Ratio of Losses to Premiums (per cent.)	Premiums	Losses	Ratio of Losses to Premiums (per cent.)
1915	$36,977,988	$17,197,415	46.5	$7,891,030	$3,705,713	46.9
1914	36,524,812	16,304,776	44.7	7,594,840	3,533,656	46.5
1913	34,522,481	15,581,234	45.0	6,928,735	3,256,227	47.0
1912	29,792,473	13,408,552	45.0	6,339,406	3,126,160	49.0
1911	27,351,626	11,837,347	43.2	7,101,666	3,314,301	46.6
1910	23,894,665	10,068,926	42.1	6,451,028	2,770,744	42.9
1909	21,446,506	8,248,182	38.4	5,714,579	2,173,386	38.0
1908	19,044,634	8,104,933	42.5	4,592,365	1,859,276	40.5

Fidelity Insurance and Corporate Suretyship.—The results in this business for the past eight years are indicated by the following table, compiled from the *Insurance Year Book:*

	Premiums (thousands)	Losses (thousands)	Ratio of Losses to Premiums (per cent.)
1915	$22,732	$7,321	32.0
1914	21,270	7,975	37.5
1913	20,027	6,947	34.6
1912	19,243	5,192	27.0
1911	16,958	4,980	29.3
1910	15,473	2,814	18.1
1909	13,283	3,200	24.0
1908	12,530	3,826	30.5

The combined results in the fidelity and surety business during 1915 show premiums received of $22,832,000, losses paid of $7,321,000, and a ratio of losses to premiums of 32.1 per cent. Considered separately, 38 companies received on their fidelity business $8,294,341 in premiums, paid losses amounting to $2,752,373, and experienced a ratio of losses to premiums of 33.2 per cent. Thirty-six companies received on their surety business $14,538,469 in premiums, paid losses of $4,569,410, and report an average loss ratio of 31.4 per cent.

Miscellaneous Forms of Insurance.—The importance of the minor forms of insurance is indicated in the following table, which presents the 1915 record for the eight leading kinds of insurance coming under this heading as regards premiums received, losses paid, and the ratio of losses to premiums. Total premium income for all these types of insurance aggregated $21,620,962, while total losses amounted to $7,769,441.

MISCELLANEOUS INSURANCE IN THE UNITED STATES, 1915[1]

Type	Number of Companies	Premiums Written	Losses Paid	Loss Ratio (per cent.)
Plate glass	39	$4,865,675	$1,843,961	37.9
Burglary and theft	41	4,750,001	1,792,101	37.7
Steam boiler	15	3,019,587	185,556	6.1
Fly-wheel	11	239,947	27,593	11.5
Automobile and teams property damage	39	6,692,937	2,626,438	39.2
Workmen's collective	24	441,584	271,718	61.5
Sprinkler leakage	3	215,518	82,312	38.1
Credit indemnity	3	1,395,713	939,765	67.3

[1] Table based on Edwin W. DeLeon's discussion in the *Insurance Year Book* for 1916, p. A-397.

XV. SOCIAL AND ECONOMIC PROBLEMS

SOCIOLOGY

HERBERT N. SHENTON

Environment.—The relations which exist between the varieties and variations (i. e., "pulsations") of climate and the behavior of the groups affected by them have been outlined and in part verified by Prof. Ellsworth Huntington in his *Civilization and Climate.* The study, which is a product of the new science of geography, is based upon an analysis of climate as a stimulus in determining human character (result of habitual reaction and selected structure) as expressed in civilization. The general nature of the inductive methods which he uses is to be commended. Of course there are errors due to the subjective element of judgments, limited sampling, etc., but it is the kind of work that must be done, and we must patiently eliminate the errors by the checks of successive investigations. Professor Huntington does seem to resolve the associations, or partial associations, between certain rather definite phenomena of climate and those of group behavior. The author, however, does not defend the hypothesis as deterministic, but remarks in his concluding chapter: "If our hypothesis is true, man is more closely dependent upon nature than he has realized," but, "a realization of his limitations, however, is the first step toward freedom."

Heredity.—Continuous collective behavior can be better understood and explained and social policies determined as we learn more of structure or tendency inheritance. The sociologist, therefore, welcomes contributions to this subject. In a well written small volume entitled *Being Well-Born,* Prof. Michael F. Guyer of the University of Wisconsin has defended the thesis that the right of rights of a child is that of being well-born. After having presented in six chapters a well digested summation of the general findings concerning heredity, he devotes the seventh chapter to a discussion of responsibility for conduct, in which he writes: "Beyond question different men have different degrees of capacity for mental and moral training." The lower degrees of capacity being associated with misery in all its forms, "Why go on *alleviating* various kinds of misery that might equally well be *prevented*" by having children well-born?

A Critique of the Theory of Evolution, by Prof. T. H. Morgan, in addition to criticizing old evidence and appreciating and presenting new evidence, develops the thesis "that chance variation combined with a property of living things to manifold themselves is the key note of modern evolutionary thought." The new evidence which Professor Morgan presents is especially valuable because of the extensive scientific experimentation from which it has been derived.

Adaptation.—The theories regarding the structure and behavior of social groups in their struggle with environment have been examined by Prof. F. M. Bristol in a scholarly theoretical study entitled *Social Adaptation.* The author, influenced especially by the theories of Prof. T. N. Carver, attempts to trace the development of the doctrine of adaptation as a theory of social progress and "to indicate the utility of the concept of adaptation in interpreting various phases of social endeavor. Adaptation is considered both as a "state" and as a "process." The "state" in relation to a physical or material environment is described as "passive physical and physio-social adaptation"; in relation to the spiritual (including social) environment, it is

called "passive spiritual adaptation." The "process," in its relation to each of the environments just stated, is discussed as "active material adaptation" and as "active spiritual adaptation." In some cases Professor Bristol has outlined the special contributions of certain writers and in other cases he has briefly and critically outlined their general social philosophy as a background for their special contribution. He claims that "the work as a whole will furnish an approach to a constructive social philosophy by a review of the systems of many writers not only in English but also in German and French." If the reader is constantly mindful of the weighting of the contributions of the various writers and the over-emphasis placed on any suggested contribution to social adaptation, the work may render much service to the end stated.

Conflict.—The conflict of groups which cannot or will not adapt themselves to each other often precipitates war. *War and Militarism in Their Sociological Aspects* was the theme of the last meeting of the American Sociological Society and consequently the title of the volume of proceedings. It includes, among others, the following papers: "War as a Determiner," by E. A. Ross; "Social Values and National Existence," by Theodore Roosevelt; "The Effect of War on the Status of Woman," by Emily Balch; "Can War Be Done Away With?" by Brooks Adams.

W. Trotter's *Instincts of the Herd in Peace and War* is an attempt to explain group coöperation and group conflict in terms of gregariousness or of gregarious instinct. The work, which is interesting and suggestive, would be much more serviceable if the author had resolved the complex "gregariousness" into simpler forms of group behavior. Perhaps the behavior which he describes as gregariousness might be explained in the phraseology of Professor Giddings by the mere concurrent reaction of the individuals in a group of similars to each other, as to like stimuli. The fact is that gregariousness seems to imply catholicity of human kind, the explanation just suggested accounting for tendencies both towards catholicity and towards differentiation of groups.

Assimilation. — Assimilation and amalgamation have recently been much discussed as indices of the actual or of the potential integrity of our own nation, especially in its relations to other nations in conflict. The press discussion dramatically centered around the "hyphen." We have been impressed that the aliens must become an integral part of our society and its institutions. Dr. F. J. Warne, in his *The Tide of Immigration*, has emphasized this phase of the immigration problem, reminding us of Congressman William Kent's statement that "the introduction of a vast number of aliens tends to prevent our progress toward democracy." After a careful statement of the immigrant as a social asset and as a social problem, he urges the adoption of a national policy not only in regard to the admission of the incoming immigrant, but also in regard to the assimilation of our "large numbers of naturalized or 'patented' citizens."

Other distinct contributions are the chapter on "The Problem of Assimilation" in Prof. H. A. Millis' *The Japanese Problem in the United States;* the chapter on "The Assimilation of the Immigrant" in Prof. A. B. Wolfe's compilation, *Readings in Social Problems;* and the chapter on "Principles of Race Assimilation as Bearing Upon Asiatic Immigration" in S. F. Gulick's *The Fight for Peace.* (See also *Immigration, infra.*)

Institutions.—The process of assimilation should be stimulated by our social institutions if these institutions are not ends in themselves, but are the means by which society is exerting "social self-control." In a volume entitled *Society, Its Origin and Development,* Prof. Henry K. Rowe has interpreted the growth and changing functions of social organization and of social institutions in general and popular terminology, and at the same time preserved much higher standards of theoretical accuracy than most of the writers who have endeavored to do a similar piece of work. He has set forth some excellent criteria of social service and has given some practical suggestions as to

how various institutions may be both impressed with social responsibility and made more effective in socializing the individuals in our present organization of society.

Professor Goodsell has written an excellent text on the history of *The Family as a Social and Educational Institution,* which contains a final well synthesized chapter on "Current Theories of Reform."

Fundamentals of Sociology, by Prof. E. A. Kirkpatrick, is an educator's discussion of the development of social groups, their various needs and activities, especially those which are educational, and of the groups as organized communities. The volume has considerable pedagogic merit to offset its many sociological deficiencies. Its best sections are those which discuss educational institutions.

CONSTRUCTIVE AND PREVENTIVE SOCIAL WORK

MARY CHAMBERLAIN

Social Centers.—The first National Conference on Community Centers, held in New York City in 1916, demonstrated that the wider use of the school plant is no longer an isolated experiment, but an established fact in most large cities and in some small ones. It was natural that at the first general gathering of community-center workers from all over the country there should be some difficulty in establishing a common ground on which to build a national body. The greatest divergence of opinion was with regard to management. One group stood for direct supervision of centers by public authority, with the school principal or his deputy present at all meetings, and for full support of centers by public taxation. The other faction favored the system in use in New York City, whereby the state or municipality issues charters to responsible groups of citizens who control the activities of a center so long as the privilege is not abused. As to finances it argued that additional public revenue should be derived from admission charges to motion pictures, dances, and the like. The conference as finally organized accepted these two fundamental principles of community-center work: (1) that community centers should be administered through responsible public officials; and (2) that tax money should be used in the promotion, development, and maintenance of community centers. Questions of administration and the exclusive support of taxation remain to be threshed out at the next conference.

Many cities recognized the political value of the school house for the first time in 1916, with the result that 143 cities in 32 states opened the schools for polling places. Aside from this development and the calling of a national conference, there was no unusual feature in the work during 1916. The intensive use of the school plant for dances, motion pictures, Americanization classes, athletics, dramatics, etc., has steadily progressed, until it is estimated there are now some 272 centers in 72 cities.

New York City has found the movement so significant that it has appointed a permanent committee of the Board of Education, to be known as the recreation committee, for the purpose of dealing with all school-center matters. The policy announced holds that the duty of the local school-center director is to discover the latent recreation aspirations of the neighborhood itself and help them find wholesome expression, a contrast to the former autocratic policy of presenting a programme formulated in the central office. The name "neighborhood centers" is to apply henceforth to activities in this field in New York City, but other places still cling to the terms "recreation," "community," or "social center," all of them referring to the socialized school plant. (See also *Recreation, infra.*)

Social Settlements.—Not yet have the social settlements forgotten the bitter winter of unemployment in 1914-15 (*A. Y. B.,* 1915, p. 420). That period of misery stirred them from apathy regarding labor conditions to a keen desire to do something for industrial betterment. Hence the trend of new settlement work in 1916 has been largely along industrial lines. In Washington, Neighborhood House established a retail shop for

articles made in settlements all over the country. In Dennison House, Boston, needlework clubs for Italian, Greek, and Syrian women not only liberated the wonderful handicraft gift of these women but aided them materially through the sale of $11,000 worth of articles. In New York City the industrial emphasis has been on vocational training and guidance: Henry Street Settlement has continued its vocational guidance and employment bureau for children; Greenwich House has extended its classes for school children held during school hours in coöperation with the Board of Education; while the employment bureau for children established in Lenox Hill House has been so successful that the Board of Education is using the whole Yorkville district for trying out vocational guidance and placement. In this, again, the settlement has demonstrated its function as a laboratory whose experiments are later taken over by an outside agency.

Another development, coming out more and more strongly each year, is the effort to make the settlement a really democratic institution by giving the neighborhood a larger share in its management. This is evidenced by the increasing number of club boys who become club leaders, and by the founding on the lower East Side, New York City, of a new settlement house by boys from the Madison Street settlement. Most of all it is seen in an action of the National Federation of Settlements, which in 1916 asked not only settlement workers and directors but representatives of neighborhood groups themselves to confer at its annual meeting.

A special way-mark in settlement work was the announcement in June of a gift of $100,000 to the "House on Henry Street," the nurses' settlement, New York City, of which Lillian D. Wald is director. The sum was presented by Elizabeth Milbank Anderson toward a fund to establish upon a permanent foundation of $1,000,000 the visiting-nurse service of the settlement, which in 1915 totaled 210,000 visits to nearly 35,000 patients in Manhattan and the Bronx.

Social Surveys.—Ever since the Pittsburgh survey of 1907, the number of social surveys made each year has steadily increased. While in 1909 hardly a dozen had appeared, in 1912 over 50 were made. By 1915 this number was doubled, and although the figures for 1916 are not yet exact, it is probable that the hundred mark will be well passed. Among the investigations of 1916, however, there has been no community-wide survey, touching and correlating the network of industrial and social problems of a single city. The only development in this field has been the publication of the two final reports of the Springfield, Ill., survey (*A. Y. B.*, 1915, p. 386), thereby completing this most thorough and important analysis of working and living conditions in a typical city of 60,000 inhabitants. Time has been given during the year to observe the effects of civic awakening in Springfield since the survey was started in 1914, and to tabulate such results as some 14 improvements in the educational system, six in the department of courts and corrections, five in health service, and nine in charitable relief.

On the other hand, the absence of a big comprehensive survey during the year is made up by a grist of intensive studies covering every field of social research. To-day both public and private organizations are so permeated with the scientific spirit that new undertakings are impossible without a careful diagnosis of the situation and expert advice. Among the specific studies the most notable achievement is the completion of the Cleveland school survey after more than a year of work and the expenditure of $50,000. Twenty brochures on such subjects as "The School and the Immigrant," "School Lunches," "The Public Library and the Public Schools," etc., and nine monographs on vocational education are evidence that the survey was social rather than scholastic, because it kept continually in mind the conviction that education should train for actual life. No less remarkable than the scope and quality of the work was the degree to which the investigation worked itself into the consciousness of all classes of people, due to the publicity given it through newspapers and public meetings. The schools have been

brought close to the people of Cleveland, with the result that rich and poor are coöperating for their improvement.

Other extensive school surveys recorded for 1916 have been made in San Francisco; in St. Louis, preliminary to a bond issue for the construction of new school buildings; and in Minneapolis, where the emphasis was placed on the kinds of vocational education most needed in the city and the best ways of providing it. Several surveys, particularly those of rural conditions, have been conducted, in part at least, by state universities, as, for example, a rural survey of Lane County, Oregon, made by the Presbyterian County Church Work on the Pacific Coast in conjunction with the University of Oregon.

Aside from the educational field, there have been countless surveys preluding vice regulation, housing reform, health clean-ups, and extended institutional care. The Baltimore vice report, for instance, published at the end of December, 1915, but felt in full force in 1916, was a horrible indictment of a city's morals by a commission which had been surveying the ground for three years (see also *Social Hygiene, infra;* and VII, *Police*). In Arkansas and in Tennessee have been conducted state-wide surveys of the facilities existing for the care of mental defectives; the U. S. Public Health Service has been active in carrying on sanitary surveys, notably in the southern states; while a unique experiment in the housing field has been the study of growth and congestion in war-boom cities—Bridgeport and Waterbury, Conn., and Kenosha, Wis.

The tendency in social surveys to obtain the services of experts is more and more apparent each year and stands out strikingly on the record of 1916. In contrast to this emphasis on scientific investigation is the increasing desire to popularize the results of surveys through newspaper and poster publicity, exhibits, and illustrated, readable reports.

Remedial Loans.—The bitterest opponents of remedial-loan legislation have now become its adherents. During 1916 small-loan brokers and companies that are professedly reformed loan sharks formed state associations of licensed money lenders in Ohio, Indiana, Maryland, Pennsylvania, New Jersey, Michigan, Iowa, and Rhode Island. These state bodies, in turn, have organized the American Association of Small-Loan Brokers, for the purpose of "uplifting and dignifying the small-loan business and assisting state associations in securing legislation fixing terms fair to the borrower and rates that will yield a fair return to the lender."

With only 12 state legislatures in regular session during the year, the number of bills designed to improve small-loan conditions has been limited. In Alabama and Maryland measures introduced failed of passage; the fate of the District of Columbia bills is still in doubt; only Massachusetts registered progress. Here two good laws were passed. The first fixes a definite maximum charge, inclusive of interest and fees, of three per cent. a month, within which the supervisor of loan agencies may determine the rate. The second law broadens the scope of the assignment-of-wage law by requiring the consent of the wife to every assignment of wages without regard to its amount or the purpose for which it is given.

There have been four test cases during 1916 in which courts have upheld the constitutionality of laws enacted in 1915 in Nebraska, Ohio, Oregon, and Texas (*A. Y. B.*, 1915, p. 387). Test cases involving the validity of the laws of New Jersey and Pennsylvania have not yet been decided. There has been increased activity in driving loan sharks to cover. Extensive campaigns to convict violators of small-loan laws have been carried on in a number of cities, among them New York, Boston, Philadelphia, Chicago, Newark and Cleveland.

Although only one new society, that of Dayton, Ohio, has been admitted to the National Federation of Remedial Loan Societies, several associations have increased their departments. Pledge departments have been added in Minneapolis, St. Paul, Rochester and Indianapolis; a wage-assignment department in Kansas City; and a new branch office opened by the Provident Loan Society of New York. During the year 1915 the

funds employed by the 36 members of the Federation amounted to $16,391,996; while 868,607 loans were made, amounting to $28,592,513, as against 849,287 in the preceding year.

The so-called "Morris-plan" companies operating in various cities in the United States and claiming to make loans on character to wage earners, have fared both well and ill during the year. A suit brought against one company by the Universal Savings Corporation for "wrongfully and unlawfully" appropriating its ideas was dismissed in the United States district court. Another case in which an injunction was sought against competitors using the Morris scheme, however, was decided adversely; while the attorney-general of Ohio held that the plan has no place in Ohio under the present statutes and that certificates to operate the plan may not be granted legally by the superintendent of banks. Yet the Morris plan continues to make progress, as 24 companies added within the year attest.

Interest is also on the advance throughout the country in the subject of credit unions or coöperative banking (*A. Y. B.*, 1914, p. 373). Eight states have enacted laws permitting credit unions and there are in operation some 60 credit unions in Massachusetts, 25 in New York, six in North Carolina, and several more scattered throughout a number of other states. Except in North Carolina, where credit unions are in the hands of farmers, and those among the Jewish farmers in New York, practically all have been developed in cities among city, state, and federal employees.

Prevention of Tuberculosis.—No gain in the field of preventive social work is more marvelous than that made by the anti-tuberculosis movement. The 1916 directory of the National Association for the Study and Prevention of Tuberculosis reports that since the last directory was issued five years ago, the number of agencies enlisted to fight tuberculosis has increased 115 per cent. Since 1904, when the nation-wide warfare on the disease was started, they have increased 1,600 per cent.

The year 1916 has contributed its share in this advance by forming or, in a few cases, reforming eight state organizations, in Vermont, New Hampshire, Utah, Nevada, Wyoming, Montana, Tennessee and Florida. Moreover, the work of existing associations has been put on a more business-like basis by substituting for volunteer service in all but seven or eight places paid full-time or part-time secretaries. The sectional conferences arranged three years ago have been further extended so that five were held during 1916; one each in the New England states, the North-Atlantic states, the Mississippi Valley states, the Southern states, and the Southwestern states. With one more planned in 1917 for the Northwestern states, every part of the country will be able to hold group discussions on such local problems as the tendency of negroes to tuberculosis, its prevalence in mill towns, etc.

Propaganda was continued during the year along practically the same lines. Three feature days were arranged for tuberculosis week, Dec. 3-10—a Sunday for special sermons in the churches; a national medical examination day for everybody, and a children's health-crusade day for enlisting the aid of the public schools in the fight against tuberculosis. The sale of Red Cross Christmas seals, which finances 90 per cent. of the work of private associations throughout the country, yielded $760,000 at the end of 1915, a gain of $210,000 over the preceding year. Three hundred million stamps were printed for 1916 in the expectation that sales would reach the million-dollar mark.

No important state measures were enacted during 1916, but in Michigan, where, in 1915, $100,000 was appropriated for a two years' study of tuberculosis, 22 of the 83 counties of the state have already been surveyed and a three weeks' campaign of publicity, free clinics, and visiting-nurse service instituted in each county.

Aside from this steady growth of the anti-tuberculosis movement, two distinctive events marked the year. One was the opening of the Trudeau School of Tuberculosis, in May, at Saranac Lake, N. Y., founded by Samuel Mather of Cleveland as a memorial to the late Dr. E. L. Trudeau. Seventeen students from all parts of the country have been accepted for

graduate research work in the diagnosis and treatment of tuberculosis. The other matter of special interest was the announcement by the National Association for the Study and Prevention of Tuberculosis of a gift of $100,000 from the Metropolitan Life Insurance Co. With this fund the Association will attempt a three-year experiment in controlling tuberculosis in a town of 5,000 people. In South Framingham, Mass., the town selected, it is proposed that every known case of whatever nature shall be under some sort of supervision during the three-year period so that the spread of the disease may be prevented, the development of new cases immediately detected, and the absolute and relative worth of the various methods employed in fighting tuberculosis determined. (See also XXVII, *Public Health.*)

Finally, although not directly in the line of preventive work, the record of the year would be incomplete without mention of the Kent bill introduced into Congress. This bill provides for Federal subsidies for nonresident consumptives who are cared for in hospitals approved by the U. S. Public Health service. Leaders in the anti-tuberculosis movement have been sharply divided on the question, some asserting that the bill would increase the burden of care of the indigent in climatic states, others declaring that the burden of care would be more evenly distributed and that the Government would help raise the standard of hospital treatment for consumptives throughout the country. Whether the bill passes or the factions come to agreement or not, the fact has been recognized that there is a very real interstate problem in tuberculosis control and that the Federal Government should assume some responsibility in the efforts to deal with it.

RECREATION

LEE F. HANMER

General Summary.—To those who have watched the trend of thought in America with reference to the recreation of the people, the year 1916 is full of significance. The tendency to look upon children's playgrounds, organized games and athletics, and social centers as fads has given way to an almost unquestioned acceptance of these agencies as indispensable factors in social progress. The main consideration now is "How can they be made to function most effectively?" The increase of facilities and expenditures over those of preceding years is a matter of far less importance than the changed attitude toward organized and guided leisure-time activities. Ten years ago when the Playground and Recreation Association of America was organized, public authorities not only did not seek counsel in dealing with public recreation, but listened with indifference when the serious consideration of this matter was urged upon them. One field secretary was all that was needed by the Association to handle the cases in which local authorities were willing to listen to a presentation of the subject. At the close of 1916 the force of 13 field workers is inadequate to meet the demands which are made upon the Association for assistance in guiding the administration of public recreation. In fact, the secretary reports that the requests now on file for counsel in local situations are sufficient to keep the present force busy for the next two years. The Recreation Congress held in Grand Rapids, Mich., Oct. 2-7, 1916, was attended by 506 delegates. Among these were official representatives appointed by the governors of ten states, while others were from school boards, park boards, recreation commissions and citizens' organizations. The facts gathered by the Playground and Recreation Association of America for its 1916 *Year Book* must be considered an understatement of the actual situation, since 86 cities which reported for 1915 failed to do so for 1916; but these figures show that for the year ending Nov. 1, 1916, 3,270 playgrounds were maintained in 414 cities, 7,122 men and women were employed in carrying on the work, and expenditures amounted to $4,234,718.45. The number of volunteer workers in handling activities and serving

on committees has not been ascertained, but it is always several times larger than the number actually employed. In 70 cities the recreations are conducted by the school board, in 31 cases park boards administer, in 42 cities there are playground or recreation commissions, in 14 there are playground and recreation departments or divisions of recreation; while combinations of two or more of these bodies do the work in 25 other places. Playgrounds are maintained in 130 instances by volunteer agencies. This often happens in cities where the local authorities are in a position to provide for a part but not all of the work. In about 90 cities and villages, recreation, social, community, or neighborhood centers, as they are variously called, are operated in public-school buildings. Recreation laws have now been enacted in 28 states. In most cases these are of a permissive character, authorizing the expenditure of public funds through established agencies or authorizing the creation of new bureaus to administer recreation facilities.

Administration.—It is still an open question whether the public recreation facilities can best be administered by the school board, the park board, the recreation commission, a city department, or a combination of two or more of these. Administration by a citizens' organization is generally looked upon as a temporary expedient, and is to be employed only until arrangements can be made for some officially constituted body to take charge. A new plan of administration has just been inaugurated in the city of Oshkosh, Wis. Here a department of public recreation and physical education has been established in connection with the school board. It is in charge of a superintendent of recreation, and is supported by a special independent two-mill tax that is mandatory on the city council on recommendation of the school board. Probably the most notable instance of recreations conducted exclusively by the school board is that of Milwaukee, Wis., where from 20 to 25 recreation centers are maintained at an annual expense of approximately $70,000. Springfield, Mass., is a typical case of administration by a park board; about 25 centers are provided with an expense budget of slightly less than $20,000. A recreation commission has charge of the 80 or more play centers of Detroit, Mich., and its appropriation is a little over $50,000. In New York City the Board of Education and the Park Department operate their recreation facilities quite independently of each other, except that a committee on recreation of the Board of Estimate and Apportionment attempts to correlate their activities as much as possible. The character of the activities and the length of time during which the centers are operated vary greatly in different cities and make comparisons on the basis of expense misleading. For instance, in Milwaukee most of the centers are extensively organized social centers which include activities for children, youths and adults, while in Springfield, Mass., the emphasis is upon children's playgrounds. Uniform methods of attendance-record keeping have not been adopted to an extent that would make comparative *per capita* costs at all reliable. The form of administration most extensively employed during 1916 is the recreation commission. It is experiencing difficulties in operating facilities not wholly under its control, such as school grounds and buildings and park spaces and field houses. Many are coming to favor an administration by a recreation department under the board of education working in cooperation with other municipal departments that have grounds or buildings which may be used wholly or partly for recreation purposes.

Legislation.—State legislation of the year bearing upon recreation has been related almost exclusively to the use of school property for after-school and evening activities. A Connecticut law provides that by a two-thirds vote, any school district may allow its school house to be used for other than school purposes, provided such use does not interfere with the school. This is not a mandatory measure in any sense. It leaves it to the people of the district to decide whether or not their school property shall be so used. In Maryland the boards of county school commission-

ers may grant the use of school buildings for other than school purposes on petition of 25 citizens in any school district. Such use of school property shall be free, but it is limited to "civic, social, and recreational activities." New Mexico has a new law which authorizes the school directors to open their school houses for the free use of "religious, political, literary, scientific, mechanical, agricultural, and industrial societies." This does not specifically mention social and recreational uses, but it is understood to include them. In North Dakota school boards may permit school houses to be used for community purposes, but "the district shall be at no expense for the same, and no furniture fastened to the floor shall be removed." South Dakota has a new law with similar provisions. Recent legislation in West Virginia provides that school trustees may allow the school houses in their charge to be used for holding "religious, political, or literary meetings, and Sunday school, and such other meetings as may be considered beneficial to the public generally," under such regulations for the care and cleaning of the buildings as they may prescribe, provided that such meetings shall not interfere with the public schools. These new measures are much less drastic than those of some of the other states enacted prior to 1916, notably Wisconsin, where the law provides that on the petition of a certain number of citizens, the school trustees are directed to grant the use of the school building outside of school hours, and to furnish heat, light, and janitor service. However, in the 28 states that now have special recreation laws, the legislation has been of a permissive rather than mandatory character.

Community Centers.—It is plainly evident that school properties throughout the United States are being used more and more outside of regular class hours. Practically every state in the Union reports this "wider use." The character of the activities, the plan of administration, and extent of such use vary greatly, however. This variation is entirely local, not sectional, nor even by states. It seems to be a matter that is determined largely by local public interest and the attitude of the school board. Two significant events in this field during the year were the establishment of the school for community workers, under the auspices of the People's Institute of New York City, and the National Conference on Community Centers and Related Problems held in New York City, April 19-22. Thirty-five students were enrolled in the school, which was in session from the middle of October, 1915, to May 15, 1916. The conference was attended by people representing 68 cities in the United States and Canada. They included school officials, directors of community centers and recreation systems, as well as prominent individuals locally interested in promoting recreational and social facilities. A similar conference is planned to meet in Chicago in 1917. One of the chief issues of the conference was the question of self support; another was the political and forum use of school buildings. Public support, in the main, for administration, supplemented by dues and admission fees for certain of the activities was the plan of financing generally approved. Reports from the various cities show the following wide range of community center activities: athletics, gymnastics, bathing, active games, folk dancing, clubs, reading, study, dancing, lectures, entertainments, society meetings, civic occasions, mass meetings, public discussions, and social occasions. The spread of this movement into the rural schools is one of the promising developments of 1916. (See also *Constructive and Preventive Social Work, supra.*)

Motion Pictures.—The educational value and possibilities of motion pictures are certainly very great, but their recreational and amusement value should not be overlooked. In the effort to improve the character of motion-picture exhibitions, the educational features have been given special emphasis, with the result that many centers established for the display of "educational films" have failed to attract sufficient patronage to justify their continuance. Specially selected programmes of suitable films for children have received the approval of everybody except the children. During the year there has

been a growing realization of the fact that motion pictures must be first of all interesting and attractive, must have real amusement and recreation values, if they are to draw and hold audiences of either children or adults. It is beginning to be demonstrated that motion pictures can be amusing and also clean, thrilling and inspiring and tragic, but at the same time wholesome. A speaker at a recent meeting gave expression to the new ideal in motion picture production when he said that pictures must be designed for "family consumption," that is, that the proper motion-picture audience is "the American family," father, mother and children. There are indications that the more progressive producers are working toward that end. Efforts to establish official Federal, state, and local censorship during the year have uniformly failed. The experiments that have been tried in this direction have in most cases failed to work out satisfactorily. Public opinion expressed through volunteer committees and boards, and working in conjunction with the National Board of Review of Motion Pictures seems to be the most effective, as well as the most democratic way of securing the desired results. There is still a rather persistent effort on the part of some producers to circulate sensational and questionable films on the plea that they tend to fortify young people against the social evils that beset them and serve as vehicles of educational propaganda in various lines of social reform. This position, however, is being definitely opposed by many who are giving careful thought to this matter, with the result that changes and eliminations are being demanded to such an extent that such pictures are shorn of their sensational features and, with little else to attract attention to them, they become of practically no commercial value. There is fair promise that the motion-picture show will eventually realize to a large extent its possibilities as an agency for wholesome amusement, recreation, and education.

Rural Recreation.—The extension of the "Little Country Theatre" throughout the farming sections of North Dakota has been one of the notable advances in rural recreation during the year. The plan originated with Prof. Alfred G. Arvold of the North Dakota Agricultural College, and has been taken up enthusiastically all over the state. He has shown the people how to dramatize their every-day interests, and with a few simple aids of scenery and costume, to produce entertainments that have the essential qualities of effective drama. "The people write their plays, they costume them, rehearse them and play them." This theatre is a part of the agricultural campaign, and not only stimulates community interest and serves as a means for the discovery and development of talent among the people, but furnishes much needed recreation of a character that is to be desired. In Virginia the "school fairs" have increased in popularity and effectiveness as a means of recreation and education, and as an important factor in developing community spirit. These are fostered directly by the educational authorities of the state. Recently the promoters of corn clubs and canning clubs for country boys and girls have realized that the addition of recreational features are necessary to the future of the movement. They have promoted in connection with these organizations, therefore, athletic games, play picnics and outings. The county play festival, stimulated chiefly by the county Y. M. C. A., is increasing in popularity, and games, athletics, singing and dramatic plays are becoming a leading feature of agricultural fairs. They are supplanting the "fakers" and cheap shows that have for years been a demoralizing feature of such occasions. In New York State the new legislation with respect to military and physical training just going into effect (see IX, *Legislation*) promises to bring into the country districts much needed opportunities for play and recreation. The committee charged with the execution of this measure consists of the state commissioner of education, the head of the state militia and a physical training expert. In the preparation of a programme for the public schools, emphasis has been given to physical training through plays, games and athletics. Definite activities have

been selected and will be promoted through the schools by a competent inspector and his corps of deputies. Other states are watching the undertaking with interest.

Publications.—Some of the noteworthy publications in the recreation field during the year are: *The Church and the People's Play*, by Henry A. Atkinson (Pilgrim Press); *The Playground Book*, by Harry Sperling (A. S. Barnes Co.); *Community Center Activities*, a handbook by Clarence Arthur Perry (Russell Sage Foundation); and *Education Through Recreation*, by George E. Johnson (Survey Committee of the Cleveland Foundation).

CHILD WELFARE

LAURA A. THOMPSON

Children's Codes.—The National Committee on Standardizing Children's Laws described in the YEAR BOOK for 1915 (p. 389) continued its campaign during 1916 for the appointment of commissions in each state to undertake the compilation of all laws affecting children. To aid in this work the Federal Children's Bureau has prepared a standard outline and has begun work on a reference index of all the state laws relating to children. About 15 states have been covered thus far. In Minnesota the governor appointed a commission of 13 to review the children's laws of that state and suggest changes to be submitted to the legislature at its 1917 session. The commission has organized for work under Judge E. F. Waite of the Minneapolis Juvenile Court as chairman. A preliminary report has been issued by the Children's Code Commission of Missouri, which will urge as its chief recommendation for administrative purposes the creation in each county of a board of public welfare employing a trained social worker. The Commission recommends a state-wide juvenile-court act, state-wide provisions for mothers' pensions, and radical changes in the laws relating to the support of illegitimate children, adoption, the licensing and supervision of child-caring institutions, and the care of the feeble-minded.

Conferences.—In July, on the occasion of the celebration of the 100th anniversary of Argentine independence, the first American Congress on Child Welfare met in Buenos Aires. Fifteen American republics, including the United States, were represented by delegates. That the subject of the welfare of children should have been selected as the best medium to bring together the nations of the western hemisphere on this occasion is a fact of great significance. The second Congress is to be held in Montevideo, Uruguay, early in 1918. At the call of the council on health of the American Medical Association a conference of various government officials and national organizations was held in Chicago on Oct. 18 for the purpose of outlining a comprehensive programme of child welfare in the interest of better coördination of national and local work. A committee was appointed to go into the subject in detail.

The Children's Bureau.—In addition to the statistical inquiry into infant mortality in Baltimore (*A. Y. B.*, 1915, p. 389), which was continued throughout the year, the Children's Bureau developed during 1916 new approaches to this problem in a series of rural studies of infant and maternal welfare and in the nation-wide observance of Baby Week, a popular educational programme carried on in coöperation with the General Federation of Women's Clubs. Since the chances of the baby for life and health are materially lessened by the sickness and death of the mother, it is becoming increasingly apparent that the protection of infancy demands the care of maternity also. A research study made by the Bureau of maternal mortality, based upon existing statistical material, has revealed the fact that over 15,000 women die annually in the United States from conditions connected with childbirth and that a large proportion of these deaths are due to inadequate care. In its rural studies, which have been begun in Wisconsin, Kansas and North Carolina, the Children's Bureau is seeking to secure data on all the social and economic

factors which effect the welfare of children, including the care given the mother at childbirth. Children's health conferences are held in the communities visited, at which individual children are given physical examination and the parents advised of defects or tendencies needing attention.

Infant Health.—The most spectacular feature of the year was the celebration of Baby Week, March 4-11, by 2,083 communities in the United States. The movement literally swept the country, extending also to the Philippines and to Canada, and won the most generous coöperation of public officials, business men, physicians, and teachers, as well as fathers and mothers. The object of the celebration was to give parents an opportunity to learn facts regarding the proper care of young children and to emphasize the need of community action for their welfare. This was done by public meetings, exhibits, children's-health conferences, plays, tableaux, school-children's essays, and the distribution of flags to the houses in which there were babies. In Kansas the governor offered a trophy to the healthiest county of the state and the best in which to rear a child, while in many cities the mayor and other city officials participated in the celebration, which has given an impetus everywhere to both public and private infant-welfare work. The great increase in the activities of municipalities along lines which affect the health of babies was made apparent during the year in the report on infant welfare in 599 cities having a population of 10,000 or over issued by the Children's Bureau. (On the subject of epidemic diseases see XXVII, *Medicine*, and *Public Health*.)

Dependent Children.—One more state, Maryland, was added during the year to the list of states, now numbering 30, providing aid to mothers for the support of their dependent children in their own homes. The Maryland act applies to widow mothers of children under 14 and provides for the payment of $12 per month for the oldest child, $10 for the next and $6 for each additional child up to a maximum of $40. The act provides a special board of mothers' relief for Baltimore, the aid being administered elsewhere by the county commissioners. Baltimore, however, was given the option of devolving the duties of such a board upon the supervisor of city charities and this the mayor and city council elected to do in November. This action is in contrast to that of New York, which amended the child-welfare law of 1915 (*A. Y. B.*, 1915, p. 391) so as to eliminate the commissioner of public charities from the Board of Child Welfare of New York City. The declared purpose of the amendment was to remove "the taint of charity" from the administration of the aid to mothers. The act, however, did not remove the superintendents of the poor from the child-welfare boards elsewhere in the state. In Arizona the initiated old-age and mothers'-pension act of 1914 was declared unconstitutional by the Supreme Court of the state. The law, which was loosely drafted, made the pension system hinge on the abolishment of all almshouses. The Court in its decision touched upon mothers' pensions only to the extent of stating that it could not sustain an act requiring the support by pensions of mothers with dependent children regardless of their financial condition.

Several investigations relating to mothers' pensions have been in progress during the year. In Illinois the Chicago School of Civics has been making an investigation of the administration of the Funds to Parents Act in the various counties of the state for the Federal Children's Bureau. An investigation covering problems of administration in several other states has been begun by the New York Bureau of Municipal Research. In Florida a commission appointed by the governor under authority granted in 1915 has been inquiring into the need for a mothers'-pension law in that state, while in California the commission on social insurance included mothers' pensions in its investigations. In New York City the Board of Child Welfare, during its first year of work, received 9,099 applications for aid. Allowances were granted to 1,084 widows with a total of 3,315 children, this being about 55 per cent. of the investigations completed. The average

monthly allowance per family was $22.80, the amounts varying from $10 to $60; 210 children of 86 mothers were removed from institutions and returned to their homes. The city budget for 1917 estimates that $1,262,000 will be needed for widows' allowances for that year. An inquiry into the work of the other child welfare boards of New York State is being made by the State Charities Aid Association.

New York's long drawn out charities investigation, which came to an end in November, sustained in the official report the city's charge that the conditions in many of the child-caring institutions bearing the certificate of approval of the state Board of Charities were "such as to be little less than public scandal and disgrace." The publicity given the investigation has been of incalculable value to children in institutions in focusing public attention on the need of adequate standards of supervision of those children for whose welfare the public assumes responsibility. In the organization of a special children's-home bureau in the Department of Charities for the purpose of placing-out dependent children in families wherever practicable instead of committing them to institutions, New York City has put itself officially in line with the recommendations of the White House Conference of 1909. The Russell Sage Foundation has conducted during the year a series of state surveys of child-helping institutions. Two published cover California and Pennsylvania; others nearing completion are for Maryland and Washington.

The large proportion of illegitimate children among those cared for by children's agencies has led to the formation in several large cities (Boston, Cincinnati, Cleveland, Milwaukee and Philadelphia) of special conferences to study the problem of illegitimacy. The Federal Children's Bureau has made during the year a study of various aspects of the problem in Massachusetts, the results of which will be published early in 1917. In Maryland the startling revelations made by the state Vice Commission concerning the "traffic in babies" in Baltimore led to the passage of a drastic law, believed to be the first of its kind, which forbids, under severe penalty, the separation of a child under six months from its mother for the purpose of placing it in a foster home or institution unless for the physical good of the mother and child, which fact must be attested by two physicians of five years' practice, or unless ordered by the court or Board of State Aid and Charities. New Jersey made the abandonment of a minor child by its mother a misdemeanor; Kentucky, the desertion of indigent children under 16 by either parent a felony. Mississippi gave the boards of supervisors increased powers regarding the placing-out of pauper children and reduced the age of children allowed in poorhouses from ten to seven, while Virginia passed an equal guardianship law and extended its license law for boarding homes to cover children up to 17 years.

Defective Children.—Two Federal bureaus, the Public Health Service and the Children's Bureau, coöperated in 1916 in a study of the social conditions and needs of feeble-minded children in Delaware. Mental tests were made of children in the public schools and social and family data secured by visits to the homes. There is in Delaware, at present, no institution for the care of the feeble-minded but an effort to secure one is to be made at the next session of the legislature. In South Carolina also an investigation into the extent of feeble-mindedness has been made by the state Board of Charities for the purpose of securing definite information to be used in a legislative campaign for state provision in 1917. In Kentucky provision was made for a state commission to study the problem of the feeble-minded, without, however, any appropriation for expenses. New Jersey continued its commission appointed in 1914. In Virginia the state Board of Charities and Correction was required to keep a register of all feeble-minded in the state with the history of each case, to take legal steps to protect feeble-minded persons and institute proceedings for their commitment, to license and supervise private institutions for the care and training of the feeble-minded, to receive feeble-minded children turned

over by the courts and place them in homes or institutions, and to instruct parents in the care and training of mentally deficient children maintained at home. Other laws provided for the commitment to and care in institutions. (See also *Mental Hygiene, infra.*)

Investigations made by the school authorities in New York, Boston, Detroit and Springfield, Mass., of the records of children from the "ungraded classes" after leaving school have revealed the need of some system of after-care and supervision of the children discharged from the "special classes" in the way of finding for them suitable employment and particularly in watching out for those who develop the need of institutional care. In New Jersey a special appropriation was made for the hospital care, instruction and support of blind babies and young children too frail or backward to enter other institutions for the blind. In Louisiana an act provided for a commission of five persons to investigate the need of an institution for the care and training of deaf, dumb and blind colored persons. Under the auspices of the committee on cripples of the Cleveland Welfare Council, a house-to-house canvas was inaugurated in Cleveland to discover the educational and economic needs of crippled children and adults.

Juvenile Courts.—Both of the bills drafted by the special juvenile-court committee appointed by the Attorney-General of the United States (*A. Y. B.*, 1915, p. 391) were before the sixty-fourth Congress during its first session. The bill removing the "criminal records" standing against over 4,000 children in the District of Columbia passed both houses in the spring. The main bill of the committee, which completely revised the juvenile-court law of the District, was adopted in the House of Representatives on April 24 by a vote of 220 to 85 and was favorably reported by the Senate Committee on the District of Columbia on Aug. 22. Its consideration is to be urged in the Senate early in the second session. Several important changes were made in state laws relating to delinquent children. In Massachusetts the recommendations of the state Commission on Probation, resulting from its survey of the administration of the juvenile law, were embodied into legislation. The amended act brings delinquent parents and guardians within the purview of the court in the original proceedings and gives the Boston Juvenile Court concurrent jurisdiction with the Municipal Court of complaints of adult contribution to delinquency. In cases of appeal a separate juvenile session of the Superior Court is prescribed and the hearings must as far as possible be in chambers. In Georgia the Juvenile Court Act, which applies only to counties of more than 60,000 population, was extended to provide in other counties for special sessions of existing courts of record to act on juvenile cases, and for the establishment in counties of 35,000 to 60,000 population of a special juvenile court upon the recommendation of two successive grand juries. In Maryland provision was made for the establishment of a juvenile court in any county when deemed necessary by the circuit judges of the circuit in which the county is located; in New Jersey, for the keeping of the records of juvenile cases in a separate book in all courts and for their destruction a certain period after the discharge of the child. Kentucky provided for a new house of reform for girls and gave power to the board of managers to parole. Mississippi established a state training school for delinquent and destitute children and provided for the appointment of probation officers for delinquent children in counties and towns.

In Chicago the bureau of social surveys of the Department of Public Welfare is making a study of the boys paroled from the St. Charles School for Boys with reference to more adequate supervision of them after their return to Chicago. On the suggestion of Judge Fisher of the Boys' Court, a committee of citizens has been formed to study the entire problem of juvenile delinquency for the purpose of working out a community programme for more effective preventive measures. The use of clinics in connection with juvenile courts in the larger population cen-

ters for the examination of children suspected of mental defect has been extended during the year. Three cities, New York, San Francisco and Seattle, dedicated new juvenile-court buildings. A new bi-monthly *Journal of Delinquency*, devoted to scientific study of problems related to social conduct, was started in March by the Department of Research of the Whittier State School, California.

Child Labor.—With respect to child labor the most important event of the year was the passage, after over 10 years of agitation, of a Federal child-labor law (see also I, *The Sixty-fourth Congress*) which establishes a national minimum standard for the employment of children by excluding from interstate commerce the products of factories employing children under 14 or children between 14 and 16 at night or for more than eight hours daily, and the products of mines and quarries employing children under 16. The bill passed the House of Representatives by a vote of 337 to 46 and the Senate by a vote of 52 to 12. It was signed by the President on Sept. 1, 1916, and goes into effect a year from that date. This act and the state child-labor legislation of the year are reviewed in detail elsewhere in this issue (see XVI, *Labor Legislation*). The Children's Bureau published during the year a bibliography on child labor and a report on the administration of child-labor laws in New York. Other reports covering Maryland, Massachusetts, Ohio and Wisconsin are in progress.

SOCIAL HYGIENE

William F. Snow

The Social Hygiene Movement.—The purposes of the social hygiene movement as formulated a few years ago by Dr. Charles W. Eliot were "to acquire and diffuse knowledge of the established principles and practices, and of any new methods which promote, or give assurance of promoting, social health; to advocate the highest standards of private and public morality; to suppress commercialized vice; to organize the defense of the community by every available means —educational, sanitary, or legislative —against the diseases of vice." This statement drew together the several lines of attack which had been followed for many years by those who realize the menace to our institutions which lies in the evils with which social hygiene seeks to cope. It included, in essence, all the educational, medical, legal, social, and moral attacks on those social problems which have attracted the attention of the public during the past few years under the title social hygiene, and which are now interpreted as a constructive programme for the promotion of conditions of living, environment, and personal conduct which will best protect the family as an institution and secure a rational sex life for the individuals of each generation.

Certain specific principles and policies have become generally accepted as essential in any programme of social hygiene endeavor. On the legal side, it is recognized that attempts to regulate prostitution have never succeeded, the policy of segregation is discredited and generally abandoned, and the strict enforcement of repressive laws is looked to as the immediate weapon of attack. Among such laws the injunction and abatement law, now in force in 26 states, is the most effective measure yet devised for the repression of prostitution. Medically, venereal diseases have become recognized as constituting one of the great public-health problems, both as to extent and as to results on individual, family, and community interests. There are now definite plans, not only for providing diagnosis, advice, and treatment for existing cases, and for protection against infection, but for measures looking toward the reduction and ultimate eradication of these infections.

Sex Education.—The primary concern of social hygiene educational effort is to teach the individual to understand the facts of sex and reproduction as they are presented to him by his environment, or by his own physical and mental experiences, and to make such knowledge an effective

guide for his thoughts and acts in such relations. This involves not only the physiology and anatomy and something of the psychology of sex, but also the laws of heredity, or what is popularly called "eugenics," the facts of venereal diseases, and such related knowledge as every mature person should have. The problem is to present effectively this body of information as it is needed by the individual as he grows from infancy to maturity, so that at each stage he may have only that information which he needs in dealing with his experiences, and yet may have it before he encounters any particular problem.

During 1916 distinct progress has been made in the work promoted by the American Social Hygiene Association. The methods in popular education have been improved, especially the preparation of new pamphlets such as *Sex in Life* by Dr. and Mrs. Donald B. Armstrong, to which the prize of $1,000 provided by the Metropolitan Life Insurance Co. (*A. Y. B.*, 1915, p. 402) was awarded, and Dr. Exner's *Friend or Enemy*, which was widely used with the United States troops on the Mexican border.

The Educational Campaign.—Educational activities during the year include those of the International Committee of the Y. M. C. A. in colleges and universities, through which interest in practical sex education has been greatly increased. Lectures, motion pictures, and pamphlets of information were widely used among the troops encamped along the Mexican border for direct instruction regarding the venereal diseases and for raising standards of sex morality, while the provision of facilities for wholesome recreation gave practical assistance by supplying occupation for the soldiers' leisure hours. In this work the cordial coöperation of the U. S. Army was given to the Y. M. C. A. and other agencies. The Y. W. C. A., through its commission on social morality, the General Federation of Women's Clubs, the American Medical Association, the American Public Health Association, and many other organizations, general, state, and local, have during the year given attention to various phases of social hygiene.

Suppression of Vice.—New legislation was limited, largely because few legislatures were in session. New Jersey and Virginia adopted the injunction and abatement law; Kentucky, an excellent white-slave law; and Massachusetts appropriated $10,000 for the purchase of salvarsan or other remedies for syphilis. Investigations and reports regarding vice conditions were made in Baltimore, Md., and Bridgeport, Conn.; a morals commission was established in Paducah, Ky. The policy of segregated prostitution was abandoned in Lexington, Louisville, and Paducah, Ky., and Springfield, Ill. The work begun in San Francisco in 1915 for the repression of prostitution through use of the injunction and abatement law has been successfully carried forward, and there seems a reasonable hope that the segregated district of that city may be done away with. Chicago, Erie, Pa., Buffalo, Washington and Indianapolis have successfully used the injunction and abatement laws of the several states against houses of prostitution. In Indianapolis the same law was used to close a theatre where immoral performances had been given.

Venereal Diseases.—Progress against the venereal diseases is necessarily slow but the year has been marked by certain important advances. A programme laid down by the American Public Health Association late in 1915 has been given peculiar force by the fact that every one of its items has been given in one place or another the test of actual experience and been found workable. It covered (1) the management of existing cases by provision of free diagnosis and advice, and treatment at dispensaries and hospitals with suitable follow-up work; (2) prophylactic measures, including some form of compulsory notification, instruction of patients and others, and medical prophylactics; (3) measures for reduction and ultimate eradication, such as repression of prostitution, facilities for recreation, sex education, elimination of alcoholic drinks, and encouragement of early marriage after maturity. Progress along the lines of this pro-

gramme has been made especially in the provision at public expense of diagnostic service by many state boards-of-health laboratories, and, in a few cities, of free or low-cost treatment by dispensaries. Compulsory notification is now required by law or board-of-health rule in 13 states and three cities in other states. It is generally admitted, however, that up to the present time reporting is either incomplete or entirely neglected.

An important piece of educational work was tried out by the New York Social Hygiene Society through a health exhibit and free advisory service for men at Coney Island during the summer season, which attracted upwards of 20,000 visitors during two months. The success of the health museum as an advertising medium was long ago appreciated by the quack doctor and advertising venereal-disease specialist, but as far as is known this was the first attempt to adapt such methods to sound public-health education with special regard to venereal disease.

On the whole, the year has shown evidence of a return to sane and conservative thinking in regard to social-hygiene work and methods. It is interesting to note that the recommendations of the British Royal Commission on Venereal Diseases made early in the year are almost without exception along lines which are already being tried out with success in this country. (See also XXVII, *Public Health.*)

Birth Control.—Among the many problems related to social hygiene which have received increasing consideration during the year is the question of birth control. The Birth Control League has held meetings, and through correspondence and pamphlets has endeavored to secure support for the repeal of prohibitive laws and the establishment of instruction clinics. The newspapers and a number of medical and social-welfare periodicals have given space to discussion of the subject. Like most questions presenting complicated medical, moral and social aspects, this one has been exploited by many who have had neither adequate knowledge nor discretion. There is some ground to hope that a more careful consideration by our leaders in medicine, sociology, and religion will point the way to such uses and limitations of birth-control methods as may be clearly for the best interests of society, not only as to the individuals of the present generation but as to the members of future generations.

MENTAL HYGIENE

THOMAS W. SALMON

Agencies of Promotion.—The specific objects of mental hygiene are to prevent mental diseases and mental defect and to promote mental health. The term is being applied in this country, nevertheless, to a wide range of activities having to do with the care and management of mental diseases and mental deficiency and to the application of psychiatrical and psychological knowledge to many social, industrial and economic problems.

Recognition of the part of the Federal Government in work for mental hygiene has led to the introduction of a bill establishing a Division of Mental Hygiene in the U. S. Public Health Service. This bill (S.2215; H.R.721) has been passed by the House of Representatives, reported favorably to the Senate, and will probably become a law during the session ending March 4, 1917. Sections on mental hygiene have been formed in the National Conference of Charities and Correction and the American Medico-Psychological Association. A session of the 1916 meeting of the American Public Health Association was devoted to mental hygiene. A quarterly magazine entitled *Mental Hygiene* is to be published by the National Committee for Mental Hygiene commencing January, 1917. The extension of interest in this new division of preventive medicine has already created a demand for instruction in the subject, and several universities are offering courses for those who desire to work in this field. It is planned to include a mental hygiene division

in the Institute of Hygiene to be established at the Johns Hopkins University.

The National Committee for Mental Hygiene has widened the scope of its work and, with increased resources, has carried on activities during the year along the general lines mentioned in the last issue of the YEAR BOOK (p. 406). New state societies have been formed in Indiana, Missouri, Ohio, Rhode Island and Tennessee. The second Convention of Societies for Mental Hygiene, held in New Orleans in April, was attended by representatives of 10 of the 13 societies established up to that time. The Committee on Provision for the Feeble-Minded has devoted itself chiefly to popular education on a wide scale, to encouraging the formation of special classes in the schools, and to securing the appointment of official state commissions to study feeble-mindedness in its various relations.

Treatment of Mental Diseases.—State surveys of the care and treatment of mental diseases have been carried on by the National Committee for Mental Hygiene during the year in California, Colorado, Connecticut, Georgia and Louisiana. The facilities for dealing with mental diseases are being carefully studied in Chicago and New York City. These surveys, which are undertaken at the request of governors, charity officials or unofficial organizations, have enabled the Committee to make recommendations of the greatest value. An important phase of the treatment of mental diseases is the rapid extension of the work of hospitals for the insane, in the communities which they serve. By means of outpatient departments, or mental clinics as they are called, social service, after-care, and popular education in the districts from which such hospitals receive patients, they are becoming in many states centers for practical and effective work in mental hygiene. At these mental clinics any case presenting a mental problem, whether in diagnosis, treatment or social management, receives the careful attention of experts.

An addition to the few existing centers for research into the causes and nature of mental diseases has been made possible during the year by the appropriation of $20,000 annually by the Sprague Foundation for the study of dementia præcox, an unrecoverable type of mental disease from which more than 60 per cent. of the patients in public institutions for the insane are suffering. It is believed that there is no larger group of persons in this country afflicted with a single form of serious disease.

A number of important changes have been made in laws dealing with mental disorders. For the most part, the new legislation shows a tendency to aid in completing the hospitalization of institutions for the insane and to provide simpler and less formal methods of commitment. Voluntary admissions have increased so greatly since this means of securing treatment was first provided that in several institutions it is the method most frequently employed. There are strong grounds for believing that before long any other means of securing treatment will be the exception instead of the rule. The growth in the extent and cost of institutional care of mental diseases has led to a critical examination of methods of general control and administration. A significant change is the substitution of a state Board of Mental Diseases in Massachusetts for the state Board of Insanity. The tendency toward the formation of central boards of control has been checked by the disclosure of some of the evils which seem to accompany this system of administration.

The Bureau of Social Hygiene has established a psychopathic hospital in connection with the Reformatory for Women at Bedford, New York. While this was the only addition made to the number of psychopathic hospitals during the year, active efforts to secure such facilities are under way in New York City, San Francisco, Detroit, New Orleans, Galveston, Nashville and in connection with the University of Iowa.

There have been no notable advances in the treatment of mental diseases during the year except in dealing with general paresis, a very prevalent and uniformly fatal disorder. Stimulated by the discovery

by Noguchi and Moore of the living organisms of syphilis in the brains of the paretics (*A. Y. B.*, 1913, p. 717), efforts have been made to combat this disease by the intra-spinal and intra-cranial introduction of salvarsanized serum. Although it seems possible by this means materially to alter the progress of the disease, there is yet insufficient proof that cures or permanent arrests can be secured. Occupation and reëducation have received especial attention in other forms of mental disease. It is becoming the general belief that mental diseases may be prevented or greatly modified by early treatment and so the detection and special management of psychopathic conditions in children are receiving a great amount of attention and facilities for carrying on this work in connection with the schools are being very strongly advocated.

Provisions for Mental Deficiency.—The great increase in popular interest in feeble-mindedness, which was commented upon in the last issue of the YEAR BOOK (p. 404), has shown no signs of abatement. The state commissions appointed in Arkansas, Florida and Indiana have continued their work. New commissions have been appointed in Delaware, Kentucky and Utah. While institutional provision for the feeble-minded is still very inadequate, according to a census made by the National Committee for Mental Hygiene in June, 1916, there were 34,186 inmates in public institutions for the feeble-minded and epileptic in this country, an increase of 44.4 per cent. since 1910. No other group of persons for whom institutional care is provided in the United States has increased at so rapid a rate, but even with the remarkable extension of interest in mental deficiency during recent years, the percentage of increase from 1910 to 1916 is less than in the period 1904-1910. There has been general approval of the formation of colonies for adult male feeble-minded persons in good physical condition. Such colonies, when connected with "parent" institutions, can be made self-supporting and seem to offer a most hopeful means of providing for a greatly increased number of cases at a minimum expense to the state. The kind of provision most suitable for defective delinquents of both sexes has received much study, but no state has yet made provision for this class.

A bill to provide an institution for the mentally defective in the District of Columbia resulted from the findings of the survey made by the Children's Bureau in 1915 (*A. Y. B.*, 1915, p. 392). As existing legislation has been found inadequate to carry on much of the work planned on behalf of the feeble-minded, attempts are being made in various states to frame suitable laws for the commitment, registration, supervision, guardianship and institutional care of defectives. The Illinois law, based upon the English Mental Deficiency Act, has received much attention in other states. A comprehensive law was enacted in Virginia as a result of the report made by the Virginia commission in 1915.

The educational authorities are awakening to their responsibilities for the care of mentally defective school children. Special classes for such children are being formed throughout the country. The demand for trained teachers in these classes has led to the establishment of special courses of instruction in a number of colleges and normal schools.

Surveys of Mental Deficiency.—During the year an important survey was completed in Nassau County, New York, to determine the social significance and the approximate prevalence of mental deficiency in a restricted area. In this survey, which was carried on by the National Committee for Mental Hygiene under a special appropriation by the Rockefeller Foundation, a careful estimate was made of the mental condition of all individuals in three areas selected for intensive study. In these areas, the population of which is about 5,000, approximately three per cent. of the total number were found to be afflicted at the time, or to have suffered previously, with some form of mental disorder, including psychoses (insanity), all types of mental deficiency, epilepsy, constitutional psychopathic states, and inebriety. About 4,000 other persons in the

county were studied, these being selected from the groups in which abnormal mental conditions seemed most likely to be found. The mass of data bearing upon the relation of abnormal mental states to delinquency, dependency and educational problems collected in this survey is without parallel and will be of the greatest value in formulating plans for dealing with mental deficiency. The U. S. Public Health Service has continued its very important school-hygiene surveys in Arkansas, Delaware, Indiana and Maryland, and has taken an active part in the survey in Nassau County. The mental examinations in such surveys are made by medical officers with special training in psychiatry, and they provide trustworthy data as to the prevalence of abnormal mental conditions in the community.

Mental Factors in Crime and Delinquency.—An unusual amount of attention has been paid during the year to the relation of mental factors to crime and delinquency. The pioneer work done by the Juvenile Psychopathic Institute in Chicago has resulted in the establishment of clinics in connection with children's courts in a number of cities. The National Committee for Mental Hygiene, through a special appropriation by the Rockefeller Foundation, established a psychiatric clinic at Sing Sing Prison on Aug. 1, 1916. The establishment of this clinic constitutes part of the general plan for the conversion of Sing Sing into a new reception prison where each prisoner received will be given a most careful mental and physical study. The clinic has proved not only a valuable means of studying the psychopathology of crime but has shown that the results of such studies can be applied very usefully to the conduct of prison affairs. Efforts are being made to establish clinics with similar aims in Connecticut, Massachusetts and New Jersey. Other evidences of the desire to study crime and criminals from a psychiatrical viewpoint are the appointment of a resident psychiatrist in the penitentiary and workhouse on Blackwell's Island, New York City, the reorganization of the police psychopathic laboratory with four psychiatrists, one psychologist and two social workers, devoting their whole time to the task of studying the mental condition of persons arrested in that city, the appointment of three psychiatrists in the children's court, and the opening of a psychopathic hospital in connection with the Reformatory for Women at Bedford, New York, for the study and treatment of a selected group of psychopathic cases among women delinquents.

Inebriety.—The mental factors in inebriety are now receiving much more general recognition than heretofore. Effective coöperation between those engaged in the study of the inebriate, the insane and the feeble-minded promises valuable additions to our knowledge of the underlying causes of inebriety and its more successful management. The growth of heroin addiction among young persons is arousing much concern, as it represents a new and dangerous form of drug inebriety. A step toward the control of this phase has been taken in the elimination of this drug from the medical-supply tables of the U. S. Army, Navy and Marine Hospital Service, and the introduction in Congress of a bill to prohibit entirely its manufacture, importation or sale. The very slight therapeutic value of heroin makes such a step possible.

CRIMINOLOGY AND PENOLOGY

PHILIP KLEIN

Education.—There was no lack of publicity in the matter of prison reform during the year 1916. The Sing-Sing situation and Thomas Mott Osborne's activities brought the prisoner to the front page of the daily press (see *infra*). Other aspects of prison work, especially problems of classification, segregation and administrative technique, were dealt with at the annual congress of the American Prison Association held in Buffalo. The executive officers of penal institutions throughout the country and others engaged in prison work exchange experiences at these congresses

both in formal sessions and at informal gatherings. Barring the partisanships developed as a result of the Osborne controversy, the tone of the meetings was as a whole harmonious, and in accord with the principles of penology which have gradually pervaded the prison world during the last decade or two. The findings of criminologists as to feeblemindedness, psychopathy, psychoses and physical inferiorities have by degrees changed the attitude of officials toward a large group of recidivists and institutional incorrigibles. No single channel has been so effective in carrying this educative material to the institution executives as the annual congresses of the Prison Association. The general movement received emphatic recognition in the Presidential platforms of both major parties.

Criminology.—The trail blazed by Dr. William Healy in criminological technique (*A. Y. B.*, 1915, p. 406) has given the general direction to that work throughout the country. The most important immediate lesson his work has taught is the desirability of attaching criminological experts to courts. These experts should be physicians with special training in psychology and psychiatry and with sociological background. It has been found easier, however, to attach such experts to penal institutions and reformatories. While this is not the ultimately preferable way, it is more practicable and, possibly, for the present, more necessary. While some differences exist in the technique of these workers, the general trend is along Dr. Healy's lines. The close relation between criminologists and penal institutions is having the very noticeable effect of intensifying the recognition by institution executives of the importance of individualized treatment of their inmates. The congress of the Prison Association bore eloquent testimony to this. Some of the newly organized criminological stations are at the Chicago House of Correction, in Sing Sing Prison, and in Essex County, New Jersey; also a psychiatric hospital has been opened in connection with the laboratories of the New York State Reformatory for Women at Bedford. Several courts have appointed psychologists, among them the three children's courts in New York City. Attempts thus far unsuccessful have been made in New York and Chicago to develop a psychological clinic in the police department for the education and instruction of police officers. A field study in criminology was undertaken by the Federal Children's Bureau during the summer of 1916 for the purpose of gaining information regarding the causes and nature of rural juvenile delinquency. The survey was conducted under the directorship of Miss K. H. Claghorn of the New York School of Philanthropy. The results have not yet been published. A bill proposing a Federal study of the criminal, pauper and defective classes was introduced in Congress but failed of passage.

An interesting feature of the year has been the apparent reduction in criminality. There is insufficient evidence available to justify definite statement or certainty as to causes. It is a fact, however, that the prison population in New York State at least has been considerably lowered. No cause can be given unless it be general prosperity. In North Dakota the low census at the penitentiary is attributed by Warden Talcott to the prohibition law. Warden Gilmour of Guelph, Ont., accounts for the decrease in Canada in the same way. The war, of course, may have been an additional factor, as it certainly has resulted in a considerable reduction of adult prisoners in England. The only serious increase reported has been that of juvenile delinquency in England. It is giving the British authorities serious concern.

Lynchings.—Complete returns on lynchings for 1916 are not yet available. According to figures presented in *The Crisis*, a periodical devoted to the interests of the colored race, the number up to Nov. 5 was 47. Detailed facts are now available for the year 1915. The total given in the YEAR BOOK for 1915 (p. 407) as 96 is approximately correct according to the tabulation by *The Crisis*. The total given by the latter for 1915 is 94, divided as follows: colored, 80; white, 14. Of the colored, 75 were men, 5 women, and 1 a child. Follow-

ing is the division by states and crimes:

Georgia	29	South Carolina	3
Mississippi	11	Tennessee	2
Alabama	9	Kentucky	2
Florida	6	Louisiana	2
Texas	5	Oklahoma	2
Arkansas	4	Missouri	1
North Carolina	3	Virginia	1

Murder	32
Stealing	9
Rape and attempted rape	9
Improper advances to women	5
Resisting arrest	6
Assault	3
Poisoning mules	3
Unknown	6
Threats and insults	3
Concealing fugitives	2
Miscellaneous	2

Especially revolting were the wholesale lynching in Georgia, in the course of which five negroes were hanged, and the cruel torture, mutilation, hanging, burning and barbarous treatment of the dead body of a negro boy in Waco, Tex.

Amelioration of Prison Conditions.—The betterment of prison conditions is not a new movement. It started in the latter part of the eighteenth century with Beccaria in Italy and Howard in Great Britain, and was known in an earlier and more modest form in the Netherlands and in Rome. In this country it dates back to the twenties of the last century. The more "acute" forms of prison reform are a quarter of a century old. They have not, however, been general or thorough. The agitation for the establishment of outdoor recreation after work and on Saturdays and Sundays and the extension of indoor recreation, such as motion-picture shows and entertainments, does not date back more than one decade. The more reasonable and generous admission of the latter and the removal of restrictions in minor, but to the prisoner important, matters, such as reading of newspapers, frequent letter writing and visits, purchase of generous quantities of tobacco, and wearing of one's own extra clothing, like sweaters and starched collars, etc., are largely due to the activities of Thomas Mott Osborne, and have been making progress even where self-government is not adopted and where the theories of Mr. Osborne have met solid opposition. To quote scores of wardens of both the old and the new schools, "prison reform has come to stay." Reports of the acceptance by institutions of the above reforms are frequent, from Massachusetts down to Alabama and to the farthest West. Unfortunately, this does not mean either the passing of cruelty from all prisons or the alleviation of terrible physical conditions still obtaining in many penitentiaries. Tuberculosis- and rheumatism-breeding institutions still abound. The lash is still used in Delaware and occasionally in Canada, the ball and chain is still used in some of the jails even in New York State, and the chain is still riveted on prisoners caught after escape in the Onondaga County penitentiary in that state. Occasional cruelties are found even in institutions conducted on the self-government plan, while they have been materially reduced in some of the notoriously old-school prisons.

Improvements are generally reported in the medical service of institutions and in educational work. Universities and their faculties are taking interest and give advice in educational work. Recent examples are Oklahoma and New York (Sing Sing Prison). A most remarkable venture in prison schools has been the development of classes and curricula at Sing Sing Prison by the Mutual Welfare League. The prison population forsook to a large extent the school conducted by the teacher appointed and salaried by the state. Evening classes were started and excellently conducted by a staff of inmate teachers under leadership of an inmate director with advice from noted educators from the outside. English, Italian, French, Spanish, arithmetic, electricity, mechanical drawing, automobile mechanics, are the chief courses. While there has been but a beginning, the progress has been almost incredible. Financial support has been generously supplied by sympathizers of the League. The development of this educational programme, as well as the complete reorganization and modernization of the medical service and the establishment of the psychiatric clinic, were made possible by the zeal of Warden Kirchwey and by the remarkable loy-

alty and coöperation which he was able to call forth from the inmates of Sing Sing. Correspondence courses have been gaining in favor and in number of adherents, especially in western prisons. Extension and new application of the honor system is reported from the state of Washington, and remarkable success from its introduction among negro prisoners in Tennessee.

Administration and Management of Prisons.—As in other administrative fields, so in the management of prison systems, the general trend is towards centralization and concentration of responsibility. In Massachusetts the Prison Commission has been abolished and a director of prisons with an advisory board has taken its place. The activities of the Parole Commission for New York City have indirectly effected the formulation of a plan for the reorganization of the Department of Correction of that city. When the plan is fully developed there will probably be one clearing house from which transfers will be made to the 14 or more unit institutions. Regardless of the technical form of commitment, whether to the workhouse, penitentiary or reformatory, all prisoners will be admitted by way of the clearing house. A staff of medical, psychological, social and institutional examiners will render advice as to the proper distribution of the prisoners. An elaborate system of classification and distribution is being prepared. Through the disorganization in the New York State Prison Department there is gradually emerging a central plan for the utilization of prison labor for efficient production and distribution. In Maryland a law establishing a Penal Board tends also towards centralization, in that the new board takes the place of two boards of directors, of the penitentiary and of the house of correction respectively, and is given certain powers of transfer and investigation. It appears, however, to be a peculiar cross between an investigating body and a board of control, and gives definite indications of being a political *coup* rather than a constructive step in administrative progress. In Chicago the subcommittee on penal and corrective institutions of the City Council's Crime Committee rendered an exhaustive report on the status and conditions of the institutions of that city and proposed a definite reorganization and the construction of new institutions.

The special blot on American penology, the county jail, has remained undisturbed. Some, it is true, have shaken off the curse of idleness and have begun to do farm and road work with their inmates, but most have not. The hardships and the breeding of criminals is continuing both among those convicted and among those who fret away months in the companionship of their fellow sufferers, awaiting the infrequent sessions of grand juries and court terms.

Thomas Mott Osborne and Sing Sing Prison.—As reported in the YEAR BOOK for 1915 (p. 409), Thomas Mott Osborne at his own request was granted leave of absence from the wardenship of Sing Sing Prison on Dec. 31, 1915, pending his trial on two indictments for perjury and maladministration involving both official and personal misconduct found against him by the grand jury of Westchester County after an investigation of Sing Sing. Brought to trial on the perjury indictment in March, he was acquitted by direction of the court on March 15. After a long legal battle he secured the dismissal on April 18 of the court of the second indictment charging gross immorality. When the dismissal was sustained on appeal on June 16, the Westchester County authorities practically abandoned the fight, and Mr. Osborne was reappointed to the wardenship on July 6, returning to Sing Sing on July 16. John B. Riley, state Superintendent of Prisons, with whom Mr. Osborne had been in constant controversy, was removed by Governor Whitman on Jan. 21. With his successor, James M. Carter, who took office on March 23, Mr. Osborne was no more successful. He opposed many of Mr. Carter's administrative orders, declaring that they were designed to discredit his administration of the prison and the operation of the Mutual Welfare League. Finally, about one month after the superintendent's order of Sept. 6 confining

lifers and long-term prisoners in all state prisons to work within the walls, which Mr. Osborne contended was unintelligent when applied to Sing Sing, where many of the offices, the farm and the stable are outside the walls, he handed his resignation to Governor Whitman on Oct. 9, to take effect one week later, at the same time attacking the Governor's attitude towards prison reform, his veracity, and his treatment of Mr. Osborne himself.

To the public Mr. Osborne is a prison reformer. Some of the specific reforms introduced by him in Sing Sing were indicated in the YEAR BOOK for 1915 (p. 409) and have been noted elsewhere in this article (see "Amelioration of Prison Conditions," *supra*). To the prison executive he meant at first a stimulus and aid in post-institutional care of the inmate, and a representative of a specific, debatable method of prison administration. By the time of his resignation he seemed to many a fanatic on self-government, an unfair adversary of all other methods and their supporters, a failure as an executive, and an intolerant advocate of methods encouraging gang-rule and corruption in the internal administration of institutions. The political attack largely responsible for Mr. Osborne's indictment in Westchester County made him regard every opponent of his theories of self-government, however honest, and even every lukewarm supporter, as personally antagonistic. Matters have worked themselves out sufficiently for us to be able now to pass certain judgments. Mr. Osborne has been the greatest stimulus to prison reform in arousing the public conscience and in popularizing many specific improvements; but he has been an unsuccessful executive, headstrong, and often hoodwinked by self-seeking prisoners. Self-government or Mr. Osborne (it is hard to tell which, for the results have not been nearly as marked at Auburn under the same system but without Mr. Osborne's personal leadership) has effected a degree of loyalty and initiative in the "gray mass" of Sing Sing's prisoners that is astounding and intensely gratifying; yet prison reform in all its important phases of encouragement, justice, opportunity and a square deal can be and is being developed where no form of self-government is tolerated or desired. Many prisoners are as active and violent opponents of self-government as prison executives, and have in numerous cases voted down its introductions or continuance. As a matter of fact, self-government has not really had a fair trial at Sing Sing, partly, at least, because of Mr. Osborne's temperament, and his partisan sympathies within the prison. The theory of reforming the worst by giving them responsibilities and showing them confidence is correct, but applicable only in small numbers and when the chief concern is the reform of the few in question. The purpose in a prison should not be to work miracles with a few, but give opportunity and encouragement to all. When the general population comes to feel that the organization is devised or functions to favor the few, then the chief purpose of self-government has fallen prey to the skill and self-seeking of its arbiters.

Legislation.—Little actual prison legislation of interest has been reported for 1916. The laws reorganizing prison systems in Maryland and Massachusetts have been referred to elsewhere (see *supra*). In New York State the long agitation to abolish Sing Sing Prison was brought to a climax and after a difficult legislative campaign a bill was passed authorizing the building of a new prison on a site and in accordance with plans to be selected by a commission to be appointed by the governor, and appropriating an initial sum therefor; and further authorizing the commission to use an additional appropriation to build a new cell house or houses to replace the notorious Sing Sing cell-block. This law marks the consummation of many years of agitation. The parole and commutation laws of New York were amended, giving more generous conditions of release, and introducing a new plan of compensation in terms of time rather than money, applicable both to men with definite terms and to the minimum terms of men on indefinite sentence (see also "Parole," *infra*).

An elaborate and comprehensive set of bills has been drawn up by the legislative committee of the Louisiana Prison Reform Association with a view to introduction in the legislature of that state (complete copy in the *Journal of Criminal Law and Criminology*, May, 1916). A bill to amend the Federal parole law and provide more lenient regulations was introduced in Congress but was badly drawn and contained many weak features that vitiated the general good intent of the bill; it was not acted upon. Bills to abolish capital punishment are reported from the District of Columbia and New York State, both unsuccessful. An attempt to obtain Federal legislation for the study of criminal pauper and defective classes fared similarly. Agitation for the abolition of state laws prohibiting the giving of information on birth control has been the cause of some criminal prosecutions in New York State and gives promise of developing into an important movement that will vitally affect the field of crime. (See also IX, *Criminal Law.*)

Sterilization of Criminals.—Little has been heard in late years on the subject of sterilization of criminals. The following extract from the report of a committee of the American Institute of Criminal Law and Criminology is significant:

> The following table shows the number of operations which have been performed under the law in the different states:
>
> *Indiana.*—No operations since 1908.
>
> *Washington.*—No operations had been performed before last year's report was written. No information has been received since then.
>
> *California.*—Insane, 634; criminal, 1; since passage of law.
>
> *Connecticut.*—Insane, 21; since passage of law.
>
> *Nevada.*—No operations.
>
> *Iowa.*—No operation under old law.
>
> *New Jersey.*—No operations.
>
> *New York.*—No operations. Case pending before courts, March, 1916.
>
> *Michigan.*—No operations.
>
> *Kansas.*—No information. No operations up to 1915.
>
> *Wisconsin.*—Feeble-minded, 24.
>
> The correspondence which has been received by the committee shows that the law is being carefully administered in the states where operations are being performed.
>
> So far as the committee has been able to ascertain, no attempt is being made to enforce any of the laws providing for the sterilization of criminals except in Washington, where the law is punitive.

Prison Labor.—The movement towards out-door labor for prisoners still continues unabated, especially farming and road building. Scores of prisons, from county jails to state penitentiaries, have purchased farms and sent out road gangs. In New York State alone three reformatories, one state prison and some half-dozen county jails have purchased or extended their farms, in some cases by leasing lands; and at least two county penitentiaries, 10 to 12 county jails, all the four state prisons, and some of the other institutions have had road gangs at work. In addition, buildings were constructed and equipped in full by prisoners, and even by the criminal insane at the Dannemora State Hospital. Excellent results have been had in California during the year, in addition to states where such work has ceased to be a novelty. In Texas 30 prisoners gained pardon from the governor by especially faithful work in cleaning up camping grounds of the militia. In Tennessee honor road camps have been established among the negro prisoners.

By reason of a constitutional amendment adopted in 1915, the year has put an end to contract labor in Kentucky, one of the states most notorious for the exploitation of convict labor for private gain. The event is important enough to reproduce an extract from a summary of the situation published by the Louisville *Times:*

> It is to be remembered to the lasting credit of Mr. O'Sullivan and Mr. Conley, of the old board, that, but for the fight made by them against big odds, the contract-labor system would now have a strangle hold on Kentucky for another eight years; that is, for that period of time, the prison contractors would continue to grow fatter at an annual financial loss to the state and to the lasting wrong of the prisoners. As it is, one of the first, if not the first, duty of the new board will be to put into effect the constitutional amendment authorizing the working of the convicts on the public roads. . . .
>
> The amendment was adopted by a majority of more than 40,000 votes.
>
> Following that adoption, the General Assembly of 1916 enacted a law giving to every county the right to apply for convict labor on its roads, this labor to be housed, fed and guarded by the state,

to be worked under the direct supervision of state engineers and to be equipped with all the necessary machinery for road building, an advantage that but few counties now possess. The price to be paid for this labor so directed is a dollar a day per man, about two-thirds the price paid for free labor, which in the majority of counties is not directed by competent engineers and does not possess the advantage of adequate machinery. . . .

There will be 300 prisoners available for road work this year. Before the close of next year, the contracts on all but 400 prisoners will have expired. A great proportion of these men can be worked on the roads and in the preparation of road material, all of them for not less than eight months, many of them for the year round. The four months' interval is one that will require study to work out successfully.

The attempt to pass Federal legislation prohibiting interstate commerce in prison-made goods has not had a fair chance of discussion by Congress because of the pressing importance of foreign relations.

Indeterminate Sentence, Probation and Parole.—Practically no opinions opposed to indeterminate sentences and probation and parole systems are now offered, except now and then at conferences of charities and correction. The most important legislation in this field is the so-called Sage compensation law in New York. The amount of commutation for good behavior is reduced and instead of it compensation for good work is given. By both good behavior and good work, a total of time off may be earned which exceeds that previously granted for good behavior; but while earlier release can thus be secured, it must be by actual effort, not merely by passive good behavior. It is hoped that the industrial efficiency of the prisoners will thus be enhanced. A somewhat elaborate sliding scale for the execution of the principle is included in the law.

In respect of probation and parole the seriousness of having a small number of officers handling hundreds of persons per officer has been much discussed and better standards are being accepted. It is probably general for an officer to have 200 and more under his care instead of the desired maximum of 50. Reference was made in the YEAR BOOK for 1915 (p. 412) to the epoch-making advance represented by the inauguration of the Parole Commission for New York City, scheduled for January 1, 1916. Already the number of recommitments on short sentences in New York has been greatly reduced, examination into the individual histories has become routine, and, indirectly, almost every feature of administration relating to the care, welfare and rehabilitation of prisoners has been affected and brought nearer modern ideals of treatment. Up to Nov. 29 the total number under the jurisdiction of the Commission were: Reformatory, 832; Penitentiary, 1,763 men, 38 women; Workhouse, 700; total, 3,333. Altogether 1,150 had been released during the 11 months, of whom only 159, or 13.8 per cent., violated their parole conditions. (See also IX, *Criminal Law.*)

New Institutions.—On Sept. 1 the Women's Reformatory at Marysville, Ohio, was opened, and 29 women serving sentence at the state penitentiary were transferred there, the women's department at the penitentiary thereupon ceasing to exist. Work was begun on the new state penitentiary for Illinois, planned on original and new lines. The psychiatric hospital, constituting the last and latest unit of the scientific buildings erected by the Bureau of Social Hygiene in connection with New York State Reformatory for Women at Bedford, was opened for the use of the laboratories and of the institution on Sept. 23. The new farm reformatory of over 600 acres to take the place of the New York City Reformatory for Male Misdemeanants was formally occupied by the institution after the removal of several hundred inmates from Hart's Island, the former location of the institution, on April 1. The boys are living and working in temporary frame buildings and are helping in the construction of the permanent buildings and in tilling the land.

Personal.—Thomas Holmes, for a number of years secretary of the Howard Association of England, resigned during the year on passing his 70th birthday. He was succeeded by Cecil Leeson, author of one of the best books on the probation system. Dr. William H. Oates, the well known

state prison inspector of Alabama, was defeated for reëlection and will be succeeded on April 8, 1917, by Dr. W. W. Dinsmore.

Charles H. Johnson, first deputy warden to serve with Mr. Osborne, and later superintendent of the Connecticut State Reformatory at Cheshire, has been appointed secretary of the New York State Board of Charities, a position of great responsibility and power. Col. Cyrus B. Adams, formerly superintendent of the St. Charles School for Boys, etc., was appointed director of the Massachusetts Prisons in accordance with a new law reorganizing the Massachusetts prison administration. Dr. Walter H. Dade, director of the Bureau of Prisons in the Philippines, has been lecturing in the United States on his work in the Philippine prisons, where some of the most modern plants and principles coöperate to make the prisons truly educative and rehabilitating institutions.

During the seven months of Mr. Osborne's absence, George W. Kirchwey, formerly professor of criminal law and criminology in Columbia University, was warden of Sing Sing. During his brief administration he effected many improvements in the physical conditions, medical care and food, obtained expert medical advisory service, and gained the coöperation of the National Committee on Mental Hygiene in the establishment of a psychiatric clinic, financially guaranteed by the Rockefeller Foundation for a period of five years. Calvin Derrick, superintendent of the Preston Industrial School, California, on leave of absence, joined Mr. Osborne's staff as deputy warden in September, and after Mr. Osborne's resignation succeeded him as acting warden. A few days before the end of the year, William H. Moyer, formerly warden of the Federal prison at Atlanta, was appointed warden.

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THE LIQUOR PROBLEM

JOHN KOREN

The Prohibition Movement.—In the November elections of 1916, 13 states and the territory of Alaska were called upon to consider the prohibition issue in some form. The results were as follows: Arkansas and Arizona voted to retain state-wide prohibition, defeating proposed amendments for local option. In California, two amendments were placed before the voters: one forbidding the sale or introduction of liquors after Jan. 1, 1920, was defeated by a majority of more than 101,000; the second amendment, forbidding the sale of liquors in saloons, hotels, restaurants, clubs and dance halls after Jan. 1, 1918, was defeated by a majority of 44,700. The total vote on these two amendments was 974,839 out of a total registration of 1,313,980. In Colorado an amendment to the prohibition law which would have authorized the manufacture and sale of malt liquors was defeated. Idaho, which already had prohibition by statutory enactment, adopted a prohibition constitutional amendment by over 55,000 majority. The vote in Maryland resulted in a victory for license in the cities of Baltimore, Annapolis, Ellicott, Brooklyn and Curtis Bay Districts, Alleghany County, Baltimore County, Prince George County and Hagerstown; while Havre de Grace, Frederick and Washington Counties voted against license. In Michigan the issue was the adoption of constitutional prohibition, effective May 1, 1918, or a "home-rule amendment" repealing the county option law and giving incorporated villages and cities the right to decide whether liquor should be sold within their boundaries. This amendment was defeated by over 122,000 and prohibition adopted by about 68,000 majority. The city of Detroit gave a majority in favor of license. In Missouri a proposed prohibition amendment was defeated by 122,000 more than 100,000 votes. Apparently the overwhelming vote against prohibition in the city of St. Louis decided the issue. On the other hand, it deserves to be noted that Kansas City gave a majority of more than 1,000 in favor of prohibition. Montana adopted statutory prohibition by a majority of more than 28,000. The new law is to become effective on Jan. 1, 1919. Nebraska voted in favor of a popularly initiated prohibition amendment, effective May 1, 1917, by a majority of 29,400, but Douglass County, in which the city of Omaha is located, gave a majority of more than 11,000 against prohibition. Oregon had before it an amendment to the liquor law which would liberalize the sale of light beverages without reëstablishing the saloon. To offset this, the so-called "bone-dry" prohibition amendment was proposed which would forbid the importation of liquors for beverage purposes. It does not appear that it was seriously intended to have this bone-dry amendment adopted, but this was the result, by a majority of over 5,000, Portland returning a majority against the amendment, while the so-called brewers' amendment was rejected by nearly 55,000. South Dakota adopted an amendment submitted by the legislature, effective July 1, 1917, by a majority of 12,354 on complete returns. In Washington two initiated measures were submitted, one providing for the sale of both beer and liquors by hotels, the other for the manufacture and sale of beer by breweries direct to the consumer. The first was killed by a majority of more than 72,000, and the second by a majority of more than 61,000 on incomplete returns. In Florida the prohibition candidate for governor was elected by a majority of about 5,000. In Utah, both candidates for governor, and consequently the victor, pledged the enactment of a state-wide prohibition law within six months of Jan. 1, 1917. Twenty-five towns in Alaska gave a majority for prohibition of 1,475 votes. (See

also II, *Popular Government;* and IX, *Law and Jurisprudence;* for official figures of the popular vote on constitutional amendments, see VI, *Amendments to State Constitutions.*)

The net result of the elections of 1916 was the addition of six prohibition states; in two of these, Florida and Utah, prohibition must be accepted by the legislature, and in Montana the dry *régime* cannot begin until Jan. 1, 1919. By that date the prospect is of 25 states, or more than one-half of the states in the Union, in the dry column. On Jan. 1, 1917, prohibition was in force in 19 states: Alabama, Georgia, South Carolina, North Carolina, Kansas, Maine, North Dakota, Iowa, Idaho, Oregon, Washington, Colorado, Mississippi, Tennessee, Oklahoma, Virginia, West Virginia, Arizona and Arkansas; with laws approved but not yet effective in Michigan, South Dakota, Montana, and Nebraska. The very notable victory for prohibition in the recent elections cannot be regarded as other than an emphatic verdict registered against the saloon. How far it denotes real enthusiasm for personal abstinence is quite another matter. There is nothing confirmatory of this in the available returns of the consumption of intoxicants.

Production and Taxation of Liquors.—During the fiscal year ending June 30, 1916, the amounts of spiritous liquors withdrawn for consumption were: spirits distilled from fruits, 2,984,743 gals., an increase of 468,689 gals. over the preceding fiscal year; and 133,241,785 gals. of spirits from other materials than fruits, an increase of 11,602,661 gals. The production of fermented liquors for the year ending June 30, 1916, reached a total of 58,564,508 bbl., a decrease of 1,182,193 bbl. as compared with the preceding fiscal year. The internal-revenue collections on the manufacture and sale of distilled spirits during the fiscal year reached a total of $155,130,909, an increase of $14,062,740, part of which the Collector of Internal Revenue attributes to increased efficiency in collection. The collections on the manufacture and sale of fermented liquors were $88,771,103, an increase of $9,415,291, which was due almost wholly to the extra tax on beer.

The outstanding fact yielded by these figures is the marked increase in the amount of distilled spirits withdrawn for consumption, which is the more notable as the fiscal year ending June 30, 1915, showed a decrease of nearly 15,000,000 gals. compared with 1914 (*A. Y. B.*, 1915, p. 413). The corresponding decrease in fermented liquors is obviously due partly to the extension of prohibition territory and partly to a natural falling off in consumption in license territory, which may be ascribed to a variety of causes. On the other hand, the recent very marked growth in the quantity of distilled spirits withdrawn for consumption, reflecting in part the disturbance of the import trade in distilled spirits due to the war, in part seems explicable only on the ground that they are supplanting fermented liquors as a beverage in nominally dry territory, from which beer, owing to the difficulty of transportation, is more easily excluded. That the increased amount of distilled spirits withdrawn for consumption means the increased use of these liquors as a beverage does not seem left in doubt by the returns of the Collector of Internal Revenue, for it is noted that there is practically no falling off in the special tax levied on retail dealers, while there has been a notable increase in the collections of special taxes levied on wholesale dealers. How far the country is growing sober in direct consequence of prohibitory enactments cannot be determined on the basis of any available statistics. The internal-revenue returns, so far as they can serve as a criterion, do not reveal a material improvement.

SOCIAL WORK OF THE CHURCHES

CLINTON ROGERS WOODRUFF

Federal Council of the Churches of Christ.—The social-service commission of the Federal Council of the Churches of Christ has continued its work of bringing the various secretaries of the denominational social-

service departments into working co-operation and of securing the organization of new departments and commissions by the various constituent bodies. It has procured the appointment of a committee representing various organizations to secure an educational service among the motion-picture concerns to set forth social activities. Subcommittees on child welfare and prison reform have been appointed. A report bringing out the moral aspect of the industrial strike in the anthracite region in Pennsylvania has been prepared. The commission has developed correspondence courses for preachers and is constantly responding to the demands of preachers, teachers of men's classes and young people's classes, college and educational institutions for literature. Owing to the death of Rev. Josiah Strong, Rev. Worth M. Tippy, acting chairman, was appointed chairman of the commission. (See also XXVIII, *Religion and Religious Organizations.*)

Roman Catholic.—At the fifth annual convention of the American Federation of Catholic Societies, held in New York City, Aug. 21-23, social service was the dominant note (see also XXVIII, *Religion and Religious Organizations*). The Federation does not embrace as yet all the Roman Catholic associations in the country by any means. The Knights of Columbus are not affiliated, nor are the Holy Name Society and a number of other equally strong organizations. A new Roman Catholic enterprise is the American Academy of Christian Democracy, a training school for young Catholic women who wish to take up social-service work. The members of this society are not a religious sisterhood and do not propose to be, but religion is the prime motive of their work. Their object is to furnish to the various Roman Catholic organizations of the United States properly trained secretaries, field agents, press correspondents, lecturers, parish visitors, trained nurses, social workers, etc. The new school will be established as a result of the gift of 175 acres by an unknown benefactor for the development of Catholic social-service work, and will be in charge of Rev. Peter E. Dietz. Fordham University has established a school of sociology and social service under the patronage of Cardinal Farley. With it is affiliated a School of Social Studies under the auspices of the Laymen's League. The Conference of Catholic Charities met in the Catholic University at Washington, D. C., Sept. 17-21. The members were urged to coöperate with non-Catholic organizations in social work.

Protestant Episcopal.—A triennial report of the activities of the Protestant Episcopal Church was presented to the General Convention held in St. Louis in October. There are now eight provincial social-service commissions and 82 diocesan commissions. The report calls attention not only to what the Joint Commission has done but to some of the problems of "life and labor" which it has studied during the past six years. In a tent beside the place of meeting of General Convention, in coöperation between the Joint Commission and the local social-service commission, an open forum was held where addresses were made every day by representative men of the Church on many phases of the social question to large companies of men and women. Ample opportunity was given for questions and the free expression of opinion. A joint session of the Social-Service and Educational Commissions was held. Addresses were made on social service by Bishop Brewster of Connecticut, chairman of the Joint Commission, by three of its members, Bishops Lines and Guerry and William Fellowes Morgan, and by the executive secretary, Rev. F. M. Crouch (281 Fourth Avenue, New York). Testimony was born by these speakers to the very considerable achievement of the Joint Commission in organizing and educating the Church in province, diocese and parish, with very moderate resources. To quote Bishop Lines, chairman of the executive committee of the Commission:

> If anything was lacking to the opportunity given and its use to advance the interest of social service in the Church at the Convention, it would be hard to name it. That the whole subject has been given a new place in the regard of the Church is certain. It is also interesting to note that the public press, which gave more attention to this Gen-

eral Convention than to any one ever held before, made special note of everything bearing upon social questions, indicating how large a place it has in the minds of all people. Despite some unwise utterances and methods open to criticism, the movement is plainly forward in the Episcopal Church and making for true democracy, bringing the Church into closer sympathy with a great company of right-minded men and women, and with those who are doing the world's hard work under depressing conditions.

The Commission published in 1916 a brochure entitled "What the Episcopal Church is Doing in the Social Field," being a record of achievement, including statements from provincial and diocesan social-service commissions, volunteer Church social agencies, and parishes engaged in institutional work and community service.

Baptist.—The absence of any one organization which officially represents the Baptists of the country makes it somewhat difficult to report their social-service activities. The Baptist World Alliance created a Commission on Social Service, and this has done something to stimulate interest in this form of Christian activity and to secure the appointment of coöperative commissions in many states of the Union and in other countries. Both the Southern and the Northern Conventions have created commission on social service, and the Southern commission has issued several very illuminating reports that have done much to clarify thought and remove misapprehension. The American Baptist Publication Society has had the work of social service officially committed to it by the Northern Baptist Convention. The Society has created a department of social service and brotherhood, with Prof. Samuel Z. Batten as secretary. In each state of the Convention's territory a social-service commission has been created to promote this work in the state, to bring important matters to the attention of the churches, and to aid the commission of the Convention. Some of these commissions are doing notable service, as in Massachusetts and Vermont. During the year there have been some signal developments. The denomination has adopted what is called the "five-year programme," of which social service is made an integral part, both as objective and as means. The great objective is the development of every church into a coöperative and social force in its community, with a resultant mighty influence of our religious life upon the nation and upon the world. One of the necessary means in the development of every church is social service. Many of the churches are taking this work seriously, are creating committees to direct the work, adopting lessons in social study, and serving the people in practical forms of community service. Practically all of the Baptist theological seminaries now have chairs of social study or social ethics. The denominational colleges, however, are lagging here, though several of them are creating such chairs. The American Baptist Publication Society is issuing a year's course of lessons on the "Bible and Social Living," designed for young people and adult classes.

Moravian Church.—The rural work of the Moravian Church is carried on under a commission of seven men, which has been at work a little more than four and a half years. *Rural Manhood*, published by the Y. M. C. A., has been put, free of charge, in the hands of every pastor requesting it. A church and country life department has been maintained in the official English weekly of the denomination. Fifteen pamphlets written by country-life leaders of all denominations, have been issued and sent to lay workers and clergymen concerned with the topics considered, and have been used almost as largely outside as within the Moravian body. Territorial conferences of rural pastors conducted by recognized leaders, have been held, and the commission is lending every assistance to such churches as are taking up the programme of community service in order that such congregations may become demonstration parishes. Fully half of the Moravian rural churches are doing some sort of community work other than holding services. Conspicuous examples of community work are to be found in the efforts at Newfoundland, Canadensis and Coopersburg, Pa. The commission believes that every country parish should know its field and base its

programme upon the results of an actual study of the field, and it is prepared to advise or assist in such work. Thus far one-fifth of the rural churches of the denomination have been surveyed and given programmes of service.

Society of Friends.—The General Conference of the Religious Society of Friends (Hicksite branch) has a committee on philanthropic work, of which J. Harold Watson, 409 Chestnut Street, Philadelphia, is chairman, and Eliza R. Hampton, 442 Potomac Avenue, Buffalo, N. Y., is secretary. This committee embraces the following departments: child welfare, equal rights, Indian affairs, industrial conditions, narcotics, peace, prison reform, proper publications and amusements, purity, temperance, and work among colored people. The Five Years Meeting of the Orthodox Friends has a social-service commission of which Prof. Rufus M. Jones, Haverford College, Haverford, Pa., is chairman, and Anna Carroll Stinson, Harveysburg, Ohio, secretary.

Unitarian.—To supply training for its clergy and laity, the Unitarian Church through its social-service department coöperated with the Meadville Theological School in holding a summer school or institute of social service. It was held at Meadville, Pa., in July and August and amply justified the faith and hope which brought it into being. The general subject of the institute was "Church and the Social Movement." A week was given to the discussion of each of four great themes: "The Church and Recreation and Education"; "The Church and Public Health," "The Church and the Labor Movement"; and "The Church and the Dependent Classes." In addition there were a series of conferences on the practical aspects and methods of service, conducted in each case by well known social workers of the community, which were of great value. The attendance at the institute came largely from the Middle West. Another institute or summer school will be held in the summer of 1917.

Denominational Secretaries.—The secretary of the Methodist Social Service Commission is the Rev. H. F. Ward, 72 Mount Vernon St., Boston, Mass.; of the Congregationalist, H. A. Atkinson, 14 Beacon St., Boston, Mass.; of the Lutherans, Rev. F. H. Knubell, 48 Hamilton Terrace, New York; and of the Disciples of Christ, Prof. A. W. Taylor, Columbia, Mo.

SOCIALISM

CARL D. THOMPSON

The International Movement.—The destructive influence of the great war continues to retard and hinder the international socialist movement. The socialist organizations are active, however, in every nation and in many of them have made decided progress during the year. The differences of opinion on matters pertaining to militarism and war continue to divide the socialists in all countries, but during the year those differences seem to have become rather less acute, and the work of drawing together the elements of the International Socialist Congress has made some progress. The anti-war and anti-militarist sentiment in the movement seems to have gained strength and influence.

Several attempts have been made since the outbreak of the war to convene a conference of the International Congress but none of them was successful in getting together more than a partial representation. In September, 1915, however, an important conference was held at Zimmerwald, Switzerland, at which, for the first time since the outbreak of the war, delegates from the nations that are fighting each other came together. There were 40 representatives from 12 different countries, including Germany and France, in attendance. The conference addressed a manifesto to the socialists of all countries urging relentless opposition to the continuation of the war and denouncing all wars as wars of aggression.

The Zimmerwald conference was followed by another held at Kiental, Switzerland, in April of this year. A conference of the Socialist parties of

the neutral nations affiliated with the International Socialist Bureau was held at The Hague, July 30 to Aug. 2. It was attended by delegates from Holland, Denmark, Sweden, Argentina and the United States. The resolutions adopted advocated free trade and freedom of the seas, condemned proposals for a trade war, urged a continued struggle for parliamentary government in backward countries, and declared that a decisive defeat on either side was undesirable and that the autonomy of nationalities must be realized through democratic decentralization of political institutions.

United States.—In the Presidential election in November the Socialist candidates for President and Vice-President, Allan L. Benson and George R. Kirkpatrick were chosen by referendum vote of the party membership. No convention was held. Benson received over 590,000 votes; the vote for Eugene V. Debs, the candidate in 1912, was 897,011 (for details of the vote in 1916 and 1912 see V, *The National Administration*). The party has shown a substantial gain in membership in 1916 over that of 1915. The present membership is 83,284, in approximately 5,500 locals and branches.

In the November elections the Socialist party did not cast as many votes as was expected, but made sufficient gains to reëlect its representative in Congress, Meyer London, from the Twelfth New York District, and to come very near to electing its candidates in at least four other Congressional districts. Morris Hillquit in New York, Eugene V. Debs in Indiana, and Victor L. Berger and W. R. Gaylord in Wisconsin each came within a few hundred votes of election to Congress. The party also elected representatives to the state legislatures of several states. There were ten in Wisconsin, two in Kansas, two in New York, one in Pennsylvania, and one in Vermont, a total of 16. The party also won considerable success in municipal campaigns during the year. In Milwaukee the Socialists again carried the city, electing the mayor, Daniel W. Hoan, after having been defeated by a combination of the old parties in 1912 and again in 1914. In Schenectady, New York, the Socialists reëlected mayor George R. Lunn in 1915 after being defeated by a combination in 1913. In the fall elections the Socialists succeeded in electing Thomas H. Van Lear as mayor of Minneapolis, thus for the first time carrying that city. They elected also two members of the city council, one member of the school board and other minor officials. The party now has 24 mayors, 207 members of city councils and 52 other municipal officials. (See also VII, *Municipal Government.*)

There are now 11 daily socialist papers in the United States; two in the English language, the New York *Call* and the Milwaukee *Leader*, three in Finnish, two in German and one each in Polish, Jewish, Bohemian and Hungarian. There are about 50 weeklies and several monthlies.

The Rand School of Social Science, founded by Carrie D. Rand for the distinct purpose of serving the socialist and trade-union movements, has established during the year a department of labor research which published for the first time the *American Labor Year Book*. It is a quite complete and valuable compilation of facts and information on the international socialist and labor movement.

Finland.—Finland is the first country in the world in whose Parliament the Socialists have the majority over all other parties combined. In June, 1916, the Socialists elected 103 of the 200 total representatives in the Finnish Diet. The total Socialist vote was 286,792, and 24 of the Socialist representatives elected were women.

Denmark.—The new Danish law providing for universal suffrage, including woman suffrage, for which the Socialists had been contending for years, went into effect on July 1. Both houses of parliament are now elected by universal suffrage and upon the principle of proportional representation. The Socialists cast 107,365 votes at the last election. They now have 32 representatives in the Folksthing (lower house) and four in the Landsthing (Senate). In July, 1915, 1,050 Socialist delegates were elected to the various municipal assemblies. In the provincial legisla-

tures the Socialists have 24 representatives.

Germany.—The majority of the German Social Democratic party continues to support the Government in its war policies, although the minority opposition has grown considerably during the year. In March, when the war credit was voted, there were 20 of the 113 Socialist representatives who voted against the measure and 22 others who left the chamber before the vote was taken. The Government continues its relentless persecution of the opposition. Karl Liebknecht has been sentenced to imprisonment for 49 months and deprived of citizenship for six years. Rosa Luxemburg, Klara Zetkin and many others have suffered imprisonment. Besides their representation in the Reichstag the Socialists have 230 members in the various state legislatures and 13,400 in the different municipal and town councils. The national headquarters are in Berlin, in a building erected by the party at a cost of $1,125,000.

Italy.—The Italian Socialist party has maintained a practically unanimous opposition to the war from the beginning. It was the only large party which signed and supported the decisions of the first Zimmerwald conference. A Reformist party represents the minority that supports the Government and favors intervention in the war.

Sweden.—The party in Sweden has been torn by dissension over the war situation but has nevertheless maintained a steady advance. The last general election put it in the position of the strongest party in parliament, having 87 representatives against 86 Conservatives and 45 Liberals in the lower house. In the Senate the party has 14 seats. There are now 426 Socialists in the city councils and 126 in the legislatures, a gain of 45.

Norway.—In Norway women were granted the suffrage in 1916 and the Socialist party vote increased 70,000. Of these 25,000 votes are reported as women voting for the first time. At the national conference held at Christiania in 1916 the executive committee of the party was instructed to establish intimate relations with the Zimmerwald international conference without, however, losing relations with the International Socialist Bureau at The Hague.

Great Britain.—The confusion in the organization of the socialist movement in England has been increased by another split in the British Socialist party. At the annual conference of this section of the English movement Hyndman and his followers withdrew and founded the National Socialist party. The Labor party (which is a federation of trade unions, the Independent Labor party, the Fabian Society and one or two other smaller bodies) continues its support of the Government, while the Independent Labor party maintains its opposition. The present labor representation in Parliament is 35.

Belgium.—The socialist movement in Belgium has suffered more severely, perhaps, than any other on account of the war. The headquarters, which were at Ghent, have been removed to London. From the first the party took a very definite stand on the war question. It abandoned all anti-war demonstrations at the outbreak of the war and issued a manifesto to all socialist workingmen in which it stated that they were justified in exercising the legitimate right of self-defense. From that time forward the whole Belgian party seems to have been unanimous in its support of the war. In Ghent Anseele is still editing the socialist paper *Voruit* under German military censorship.

France.—Like the Belgian party, the French Socialist party has supported the Government in the war and its representatives were strongly supported in their position in this respect by resolutions passed by the National Council held in April. The vote was 1,987 in favor to 960 against the resolutions. In spite of the fact that the northern section of the country now occupied by the Germans had 12,000 of the party members, and that neighboring sections also had a large party membership which has all been wiped out by the war, the party seems to have flourished. The report of the secretary, Dubreuilhin, given on March 6, 1916, states that 1,500 of the 2,000 branches that were active before the war are still active, that the number of federations is still

83, the same as before the war, and that 24,638 new members were taken in during 1915. The French Socialists have developed the municipal phase of socialism earlier and more completely than any other of the national movements. Some 282 cities and towns have been under control of the Socialists and there have been as many as 5,530 Socialists elected to municipal offices.

Russia.—Following the protest of the Socialist members of the Russian Duma against the war credits in 1914 five of them, Petrowsky, Muranoff, Badaeff, Samoiloff and Schagoff, were exiled to Siberia. Nevertheless, the Socialists have maintained an attitude of unyielding opposition to the Government and its war policy. Besides the main organization of the party there are several other national groups which belong to the party and support its position.

Austria.—In March a national conference of the German Austrian party was held in Vienna. There were 246 delegates in attendance. Victor Adler set forth in a speech and resolutions the policy of the great majority of the party. The resolutions, which justified the national war policy, were adopted by the conference with only 15 opposing votes.

IMMIGRATION

FRANK JULIAN WARNE

Immigration and Emigration During the Year.—The second year of the European War has had the effect upon immigration to the United States of reducing the volume of permanent alien arrivals for the fiscal year ending June 30, 1916, to a number less than that of any of the preceding 18 years. According to the records of the Federal Bureau of Immigration, permanent immigration for 1916 was only 298,826. Including 67,922 temporary or non-immigrant arrivals, the total immigration for the fiscal year was only 366,748. Compared with the 1,403,081 arrivals in 1914, this is a decrease of 74 per cent. Emigration from the United States during the fiscal year was 240,807, compared with 633,805 in 1914. Total immigration was less in volume during the year than in the first fiscal year immediately following the outbreak of the war, the statistics being 366,748 and 434,244 respectively. Total emigration also was less in 1916, there having departed in that year 240,807, compared with 384,174 in 1915. The number of departures for each 100 arrivals was 62 in 1915 and 43 in 1916. Aliens departing were 312,746 less in number in 1916 than the yearly average from 1908 to 1914, both inclusive. As to net immigration, the difference between total immigration and emigration, the second year of the war showed a gain in arrivals over the first year of 75,871. The decline in immigration since the beginning of the war from the more important countries of origin, including Austria-Hungary, Germany, Italy, Russia, Turkey, the United Kingdom and Scandinavia, was compensated in part by increased immigration in 1916 compared with 1915 from Greece, Canada and Mexico, each of these countries showing a larger net permanent immigration for 1916 than for the first year of the European War.

Of the immigrant arrivals in the fiscal year 1916, Italians were the most numerous, totaling 38,814, or 13 per cent. The English came next with 36,168, or 12 per cent. Greek immigrants numbered 26,792, or nine out of every 100 alien arrivals. Irish, French, Scandinavian, Mexican, Hebrew, Scotch, Portuguese, German, Spanish, Japanese, Dutch and Flemish, Finns, Russians, and Poles, came next in this order of importance. Poles, Russians, Magyars, Croatians and Slovenians, Ruthenians, Slovaks, Roumanians, Lithuanians, Finns, and Bohemians and Moravians, all of which races were of considerable importance in the 1914 immigration, decreased strikingly in 1916. As indicative of this decrease in immigration from the warring countries, the statistics show that in 1916, compared with the average of the three years preceding the outbreak of the war, arrivals from Austria-Hungary dropped from 237,000 to about 5,000; from Russia, from 236,000 to less

than 8,000; from Italy, from 235,000 to less than 34,000. The more important countries of southeastern Europe with the exception of Italy, which came into the war later, decreased their emigration in 1916 to numbers less than those sent annually by these countries as far back as 1882.

A tendency in immigration disclosed by the 1915 and 1916 statistics, which is likely to become more pronounced as the war continues as well as following its termination, is the larger proportion of females among the arriving aliens. Heretofore our immigration has been predominantly males, but during the past two years the proportion of females rose to 43 and 39 per cent., respectively, as compared with 32 per cent. in 1914, the former being a larger percentage than in preceding years.

Restrictive Legislation.—It is clear that the one outstanding effect of the European war upon immigration has been a continued reduction in its volume. With the menace of a large inflow temporarily removed, public interest in the immigration problem has shifted somewhat from a demand for legislative restriction, although efforts were continued in the Sixty-Fourth Congress to secure the enactment into law of the Burnett bill (see also I, *The Sixty-Fourth Congress*). This measure retains the literacy-test provision which caused President Wilson to veto the bill in 1915 after it had been passed by large majorities in both houses (*A. Y. B.*, 1915, p. 400). On March 30, 1916, this bill was again voted upon by the House of Representatives, the result being 308 in favor of and 87 against its passage. It was favorably reported from the Senate Committee on Immigration in April but remained upon the Senate calendar until the close of the session notwithstanding repeated attempts to secure its enactment into law. Because of the refusal of the Democratic party caucus to include this measure among those to be enacted during the first session of the Sixty-Fourth Congress, nine members of the Senate bolted their party and voted with a majority of the Republicans to force it to a vote. Intimation from President Wilson that he was prepared again to veto the bill, if passed, caused action to be postponed. The Senate passed the bill, however, on Dec. 14. In the Sixty-Fourth Congress 21 other bills relating to immigration and 13 relating to naturalization were introduced but none of them became law.

Industrial Effects of Reduced Immigration.—With the European War suddenly shutting off the foreign supply of unskilled labor, the domestic demand was compelled to seek other sources. This resulted in the importation to the northern industrial centers of Mexican peons and also of negroes from the southern states. So great was this transfer of labor from the South that the authorities in that section had recourse to statutory enactments to prevent the operation within their borders of labor or employment agents. This resort to the labor supply of the South by contractors, manufacturers, railroads, mine operators, and grain growers in the northern, eastern, and western states resulted in the movement of large numbers of negroes into those sections. This was encouraged by leaders among and sympathizers with the negro race, who saw in the movement large and favorable economic opportunities which they believed to be of beneficial effect. Negro labor was resorted to also for domestic servants, as waiters, bootblacks, drivers, and like occupations which heretofore have been filled by the immigrants.

This widening of economic opportunities for the negro has been conspicuous among the striking effects upon internal labor conditions of the cutting down of the volume of immigration. Equally important among these effects has been the virtual cessation of unemployment throughout all the industrial centers, thus removing a menacing problem that had been growing extremely serious in several winters before the war (see also *Unemployment, infra*). Increases in wages, reductions in the hours of labor in many industries, and the establishment of other improved conditions of employment, have also been some of the effects of this restriction of immigration (see also XVI, *Labor*). These effects are some of the benefits prophesied by restrictionists

as among those that would flow out of the application of restrictive measures.

Problems of Assimilation.—During the year Independence Day continued to be observed in many cities as Americanization Day. On such occasions special efforts were made to secure the attendance of large numbers of foreign-born to hear patriotic addresses and through naturalization to be welcomed into citizenship. Another phase of the nation-wide campaign for the Americanization of the immigrant which was manifested during the year was that which emphasizes preparedness for citizenship through the public school. This was extended to more than 800 cities. The movement includes the preparation of special text books for the instruction of the immigrant in the English language and citizenship and the institution of night schools. The first National Conference on Immigration and Americanization was held in Philadelphia on Jan. 19 and 20. In view of the loss of effectiveness from the multiplication of agencies working in this cause without coöperation, it was resolved that a special committee should be appointed to formulate a plan for eliminating duplicate activities, assisting local organizations, and facilitating the formation of national plans for the instruction and Americanization of immigrants.

Internal events, threatening danger to our domestic tranquillity, accompanied the partisan activities of those foreign-born within our borders who still held allegiance to their mother country. These became a more or less important issue in the Presidential campaign, both candidates in their speeches emphasizing the necessity of allegiance of the foreign-born first to their adopted country. Hyphenism and Americanism were campaign issues. President Wilson in particular made it plainly understood that he wanted the votes of no men who placed allegiance to any foreign country above allegiance to the United States. The national committees of both the Republican and Democratic parties organized special bureaus for the preparation of literature and the securing of speakers in order to communicate with the foreign-born citizens in their own languages. (See also I, *The Presidential Campaign.*)

VOCATIONAL EDUCATION AND GUIDANCE

ARTHUR D. DEAN

National Movements.—During the year much emphasis has been laid upon "prevocational" or junior vocational high-school work. It is intended to stand for that kind of grammar-grade or middle-school training which is needed by the boy or girl who is headed toward industry but not yet old enough to be in the trade or vocational school. It is interpreting a new type, or at least a much modified type, of general training especially suited to the needs of those who are to become industrial workers. It seems to be quite largely a "trying-out" type of vocational education. The plan of six years of elementary education for acquiring the tools of expression, three years of intermediate or junior work, and three years of senior high-school work will provide in these middle years, first, better provision through differentiated courses for individual needs, and second, easier transition to differentiated vocational courses in the secondary school, and, through reform in instructional methods, will hold children in school and save them from "blind-alley" occupations. The great interest in this plan of differentiated courses, vocational and academic, after the sixth grade, is likely to prove the most significant vocational-education movement of the year.

The passage of the Federal child-labor law (see XVI, *Labor Legislation*) will have marked effect upon our state education programmes. It will have a tendency to extend the compulsory continuation-school idea, now for 14-16 year old children, to cover those between 16 and 18; it will make it necessary to provide vocational-education facilities within the school in view of the fact that employment of young children is hampered more than ever; it will be likely to promote differentiated courses in schools in order that children

may have their capacities and interests studied with a view of preventing elimination, which is the immediate antecedent to leaving school and seeking a child-labor type of job.

State Movements.—Pennsylvania has established a system of compulsory continuation schools and has made substantial beginnings. It has equipped 341 class rooms and employs 250 special teachers; 23 classes are held in factories and 25 in stores. It is expected that the results will be doubled by Jan. 1, 1917. "Educational clinics" is a popular terminology for definite local propaganda work along lines of survey and discussion in various communities of Pennsylvania.

Massachusetts deservedly won the gold medal at the Panama-Pacific Exposition for its exhibition of state-aided vocational education. Correspondence courses under the auspices of the Massachusetts State Board of Education have been organized to meet the needs of industrial workers. State aid is now given towards industrial work for high schools in Texas. Wisconsin has pushed the age of compulsory attendance further than any other state. Hereafter, children between 16 and 17 not attending regular public schools are obliged to attend day continuation schools for half a day a week, eight months in the year. The governor of Rhode Island urges similar provision for children between 14 and 16.

Local Movements.—A New York City survey to include an analysis of two trades, printing and machine work, is being conducted by the cooperation of state and national Departments of Labor, employers, and employees. Indianapolis is conducting an intensive survey of social and economic conditions of graduates from public schools of the United States to determine whether such graduates have made as much progress in life as graduates of academic schools.

A trade extension bureau has been opened in New York City which provides a place where the city's unemployed or commercial workers may gather for the purpose of maintaining speed and skill in their work. A vocational survey in Evansville, Ind., included a study of the factory, business and school conditions. Specific study of vocational needs in connection with general school surveys has been made at Cleveland and Columbus, Ohio (see also *Constructive and Preventive Social Work, supra*). The Minneapolis survey, promoted by the National Society for the Promotion of Industrial Education in coöperation with local bodies, has brought out the full significance of survey work as a vital factor in organizing vocational education on a proper scale. Emphasis is given to the importance of coöperative agreements between employers, employees and the vocational schools. The U. S. Bureau of Education has coöperated with the Delaware Coöperative Educational Association in studying the essential facts and possibilities as a basis of suggestion for industrial school work.

Training Teachers.—Columbia University has dispensed with its shops for training industrial-arts teachers and is confining itself to training men and women who already possess technique and desire only advanced work in administrative problems. Carnegie Institute of Technology is developing technical courses for training vocational teachers. George Peabody College for Teachers at Nashville, Tenn., Oswego, N. Y. Normal School, Oregon Agricultural College, the University of Kansas and the University of Illinois have materially strengthened their work in similar directions. The Women's Educational and Industrial Union of Boston has announced a year's course in vocational guidance to fit women to become vocational advisers. Johns Hopkins University is meeting new state requirements for teachers of vocational subjects by offering courses. The Russell Sage College of Practical Arts at Troy, N. Y., has established a department for training women teachers for industrial, household and commercial arts. State summer schools for training continuation teachers have been held in several of the large cities of Pennsylvania. A correspondence course in vocational guidance for teachers has been established at the University of Chicago.

New or Extended Developments.—To show the extent and scope of the growth in vocational education and

guidance, mention should be made of the trade extension work at Fort Wayne, Ind.; the greatly increased vocational opportunities at Girard College, Philadelphia; the coöperation of employers at Denver, Col.; part-time classes in Kansas City; the College of Industrial Science at Toledo with its new programme of service to industrial interests of the community; and the revival of the Winona Institute at Indianapolis under the auspices of the city and conducted as a technical high school. Vocational junior-college work has been established in San Francisco to train men for the middle positions between the professions and the crafts. Reorganization of the coöperative industrial departments in Johnstown, Pa.; trade agreements between schools and industries in Tacoma, Wash.; prevocational schools in Bridgeport, Conn.; Junior vocational schools in Trenton, N. J., Cleveland, Ohio, Rochester, N. Y., Providence, R. I., Springfield, Mass., Erie, Pa., and Kansas City, Mo.; and coöperation of Carlisle Indian School of Pennsylvania with the Ford Automobile Co., are all marks of progress. Manchester, Conn., offers instruction in silk textile work. A coöperative vocational bureau at Dartmouth College to aid students in getting business experience during summer vacations is noteworthy. Coöperative and day continuation schools have made great advances in New York City. The Chicago Association of Commerce through a subcommittee on vocational guidance is making efforts to deter children from prematurely leaving school to enter industries. Courses in salesmanship are being offered in Buffalo, Troy, Boston, Cleveland and Minneapolis. The city of Philadelphia plans to furnish continuation classes for 15,000 children.

The fact that only a small number of men committed to penal institutions have a trade is rapidly causing boards of management of these institutions to recommend expenditures for proper equipment and necessary teachers for all kinds of trade courses. Sing Sing Prison in New York State, the reformatory at Cheshire, Conn., and the Boys' Industrial School at Shirley, Mass., are notable examples of the new movement.

Societies and Associations.—The tendency is towards the formation of technical societies independent of older teachers' organizations either for the gathering of persons concerned with one branch of vocational instruction or with a group of common interests; examples of this tendency are the International Association of Teachers of Printing, and the section of printing teachers in connection with the Western Drawing and Manual Training Teachers' Association. A Vocational Guidance Society of California has been organized. The Vocational Education Association of the Middle West has taken the initiative in promoting a vocational-education bill through the Illinois legislature. The National Vocational Arts and industrial Federation held its annual meeting in Cincinnati. There was a special section devoted to the larger social and economic phases of vocational education and guidance at the second Pan-American Scientific Congress held in Washington early in the year.

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COÖPERATION

JAMES FORD

Coöperative Organization.—In the strict sense of the term, a coöperative association is an organization of men of relatively small means who unite their capital and their effort democratically in the pursuit of some form of trade or industry. Through coöperative organization they seek to avoid waste in the conduct of business and generally seek also to save for themselves profits which would otherwise fall into the hands of private business men: retailers, wholesalers, manufacturers, jobbers or bankers. The coöperative movement, in its pure form, also invariably contemplates a scheme of social reorganization which would tend to promote justice in distribution of wealth and brotherhood among men. In the main, it may be said that the moral ideal characterizes American coöperative associations less than those of Europe, but is, nevertheless, prominent here in the minds of coöperative organizers. The essential distinguishing characteristics of the coöperative association are generally (1) open membership, (2) equality in voting (each man having but one vote irrespective of the number of shares which he holds), and (3) a limited interest upon shares, dividends being returned to members in proportion to the amount of business which they do with the company.

Coöperation in Agriculture.—In volume of business the farmers' coöperative movement is much more significant than the movements among the working classes in cities. The number of associations among farmers is estimated by the U. S. Department of Agriculture to comprise several thousand societies engaged in buying, selling, warehousing, or in specific trade enterprises, such as grain elevators, live-stock shipping associations, egg and poultry circles, etc. A number of organizations of national scope tend to foster the farmers' coöperative movement. These include the American Society of Equity, the National Grange (especially through its state branches in the East), and the Farmers' Educational and Coöperative Union. The Office of Markets and Rural Organization of the Federal Department of Agriculture has for three years fostered coöperative organization directly through special studies and publications. Many states are also equipped through their departments of agriculture or their agricultural colleges with promoters of coöperation. The National Conference on Marketing and Farm Credits has considered co-

operation in the four congresses which have been held. In 1916 a large part of its meeting (Dec. 4-9) was devoted to the discussion of this subject. The Conference has already established the National Agricultural Organization Society for the promotion of coöperation. (See also XVII, *Agriculture.*)

Coöperation of Consumers.—Among the industrial classes the coöperative movement is less conspicuous if we except from consideration the building and loan associations and mutual insurance companies which are cooperative in type. Millions of American citizens are members of these two latter types of coöperative associations, but take little part in the direction of their activities, even though their by-laws make it possible for them to do so. In American cities there are undoubtedly hundreds of coöperative stores which are affiliated with no outside organizations, working independently and against serious difficulties. Some of these succeed, but the majority fail after a brief existence. There are many other organizations termed coöperative which are not strictly so, as they are so framed as to permit inequality in management or in distribution of business gains. There are, however, several organized coöperative movements in America, each combining for social, educational or business reasons from 20 to 100 local organizations, generally consumers' grocery companies.

The most conspicuous of America's coöperative movements until the year 1916 have been those organized about the Rochdale Wholesale Co. of San Francisco and the Right Relationship League of Minneapolis. The former once brought together in more or less close affiliation 100 or more stores. To-day not more than 40 coöperative associations are affiliated with the Coöperative Wholesale Co., as it is now called since reorganization. A new development in the Pacific-coast movement was the establishment of the Pacific Coöperative League, organized a few years ago, to serve, first, as a coöperative society at large, buying for local clubs directly from the wholesale company, and, second, as an educational and propaganda agency for the Pacific coöperative movement. It now includes 900 members.

The Right Relationship League, which a few years ago united more than 100 stores and published a cooperative journal known as *Coöperation*, has discontinued the publication of its journal and has been placed in the hands of a receiver. Its former secretary, E. M. Tousley, is now manager of the American-Rochdale League which was established on April 1, 1916, and which is stated to be serving as an educational and propaganda agency for this coöperative movement in the states of the Middle West.

Organized Labor and Coöperation.—These two coöperative movements comprise in their membership both farmers and city workingmen and persons rated as of the middle classes. There is a manifest tendency east of the Mississippi River for the coöperative movement to develop among the industrial classes and among persons with radical theories concerning the rights of labor. The American Federation of Labor has not helped the coöperative movement at any point, but local unionists in Illinois have assisted and fostered coöperative organization. The movement in Illinois, developed by the United Mine Workers and the Federation of Labor of that state, held its second annual convention at Staunton, July 31-Aug. 1, 1916. This was a notable meeting, characterized by seriousness, business-like methods and coöperative spirit. The president of the Illinois State Coöperative Association is also president of the state branch of the United Mine Workers. His opening address is one of the significant contributions to coöperative literature of the year because of its emphasis upon Rochdale methods, which European as well as American experiences have proved to safeguard best the interests of consumer members, its reconciliation of the aims of unionism and coöperation, its insistence on the sale of union-made goods and hiring of union clerks in coöperative stores (an essential expression of industrial idealism), its submission of definite plans for the establishment of a wholesale society by the associations

represented in the convention, its warning concerning the granting of credit, and its definite encouragement of social features, educational classes and affiliations with agriculturists. It was voted at this conference that a competent agent be hired by the federated societies to make combined purchases for the local stores, thus securing better prices.

New Organizations.—Another significant event in the history of cooperation during the year was the establishment of the Coöperative League of America, founded in New York in the spring. It was initiated by Albert Sonnichsen and William A. Kraus, who for some years have been publishing the *Coöperative Consumer* and federating coöperative societies in and near New York City. The League is under the presidency of Dr. James P. Warbasse, and its secretary is Scott Perky. The *Coöperative Consumer* remains the organ of this new League, which aims to combine consumers' coöperative movements of America and to foster cooperation, especially among the industrial population. It aims to promote better business methods and better spirit in coöperative organizations and to keep alive coöperative ideals. Though the League is still handicapped by insufficient support on the part of the coöperative associations, which are slow to realize its utility, it is already in a position to provide admirable service by way of advice on questions of coöperative law, business methods, constitutions and by-laws of societies, and auditing systems.

There are other coöperative movements of less conspicuous merit but nevertheless important. A group of buying associations affiliated with the Nelson Coöperative Association of New Orleans is stated to include over 60 retail stores and several factories. It is, nevertheless, not strictly cooperative in all features, due primarily, it is stated, to inadequacy of the corporation law of Louisiana. The coöperative movement of Iowa has abandoned its federation, but many of the local associations maintain their vitality. The Coöperative Union of Canada still unites a scattered group of stores and through its official organ, the *Canadian Coöperator*, promotes the pure type of coöperation.

Coöperation among Socialists.—There is a coöperative movement among the socialists of Oklahoma and another in Chicago, centered in the Socialist Exchange at 2659 Fullerton Avenue, a wholesale society of which local coöperative stores, local socialist clubs and other groups may become members upon paying a $25 fee. Finnish immigrants of America, through their socialist federations, have organized a coöperative movement which includes about 60 stores located in 14 different states. The first convention of these stores was held in October, 1915, in Waukegan, Ill., and a second in June, 1916, in Superior, Wis. At this latter conference, a Finnish coöperative league for the entire United States was established, the headquarters of which will be at Waukegan, Ill. Cooperation has been widely discussed among the more independent groups of socialists in America, but has not yet been definitely fostered by the national conventions of the Socialist party, which has had the matter studied for several years but has been slow to promote the utilization of the coöperative movement for achieving socialist ends.

Legislation.—There have been no very significant changes in American legislation governing coöperative associations of industrial workers during the year. New laws have been passed in Iowa and South Dakota, but these do not improve in any way upon the Wisconsin law of 1911, which is still the best model for other states to copy.

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UNEMPLOYMENT

JOHN B. ANDREWS

Extent of Unemployment.—The unemployment situation in 1916 was in general the reverse of that of the two preceding years. As the industrial depression of 1914-1915 was succeeded by a period of marked prosperity, the amount of unemployment dropped from abnormal heights to an unusually low level. The U. S. Bureau of Labor Statistics, which began in 1916 the collection of monthly statistics on the labor market throughout the United States, reported returns from 301 "representative" establishments in eight important industries, showing about 10 per cent. more workers employed in July, 1916, than in July, 1915. The Bureau of Statistics of Massachusetts reported that on March 31, 1916, 3.9 per cent. of the members of over a thousand trade unions were out of work from industrial causes, whereas a year before 12.8 per cent. were unemployed for that reason. Another significant indication of the improvement in employment conditions was the decline in the numbers receiving charitable aid on account of lack of work.

The increased demand for workers was not confined to a few lines, but was general throughout the basic industries. War orders were no doubt responsible for much special activity in the steel industry and the metal trades, which reached an almost feverish pitch during the spring months. In the late summer, however, a decrease in the forces of eastern munition factories caused a slight slackening in the demand for labor in that section. Eastern manufacturing plants began to increase their forces in the latter months of 1915, but unemployment among clerical workers and on the Pacific coast was not much reduced until the spring of 1916. Statistics collected in New York by the Bureau of Statistics of the Industrial Commission, probably typical of the general course of employment during the first ten months of the year, show a decided improvement in the amount of employment dating from October, 1915, and reaching its highest point in April and May, 1916, with a slight decline during the summer months and another rise in the autumn. Irregular unemployment due to seasonal fluctuations and to changes in individual establishments continued, however, in spite of increased prosperity.

General Movement against Unemployment.—With the passing of the crisis of 1914-1915, general public interest in unemployment quickly declined. In some communities this unfortunately led to an entire neglect of the subject, but in a few instances the freedom from emergency calls was utilized to develop constructive and preventive programmes of work. The Minneapolis Civic and Commerce Association organized a special committee with a comprehensive plan of action, including the regularization of work by private establishments, improvement in the work of public and private employment agencies, and a study of unemployment insurance. In New York City Mayor Mitchel appointed a smaller committee to succeed the one formed during the crisis of 1914-1915 and to work out preventive measures. The subject was taken up in the state as a whole by the New York State Conference of Mayors, which recommended at its spring meeting the opening of more branches of the state public employment bureau, the conscious planning and adjustment of public work as far as possible for dull years, and the establishment of farm colonies for vagrants. Two more official "in-

vestigations" of unemployment were authorized, the new Maryland Department of Labor and Statistics and the Massachusetts Social Insurance Commission being directed to study the question.

Reports and other publications dealing with unemployment were less numerous than in 1915. A particularly important study, however, was Joseph R. Willits' "Unemployment in Philadelphia," which dealt with chronic unemployment and with plans for remedy, especially through greater steadiness in private industry. A number of emergency organizations, such as the original New York Mayor's Committee, reported on work during the crisis. The Commission on Unemployment of the Province of Ontario, Canada, brought out a comprehensive study of the Canadian situation, with plans for improvement drawn from European and American experience. Bulletins of the U. S. Bureau of Labor Statistics dealt with irregular employment in the women's garment industry and in Boston retail stores and summarized the results of the unemployment investigation carried on by the Metropolitan Life Insurance Co. in 1915 (*A. Y. B.*, 1915, p. 423).

Relief Work.—Except in the Far West during the earlier months of the year, few special relief measures were necessary in 1916. The Rocky Mountain and Pacific coast cities, however, were obliged to provide shelter for considerable numbers of unemployed men. In the East some attention was given to improved care for the unemployed transient, "the most elusive subject of charitable endeavor." A convention of mayors held at Jacksonville, Fla., in January, representing nearly 150 cities in the seven southeastern states, took up the question with special reference to the "passing-on" of vagrants from one city to another. As a result of the conference several cities signed an agreement to abandon the practice. A number of private organizations sheltering homeless men in return for the work of repairing cast-off clothing, household utensils and the like, which are then sold at low cost to the poor, formed a league under the name of "Good-will Industries" for the purpose of expanding this type of relief work.

Employment Exchanges.—The movement toward the organization of the labor market by means of employment bureaus has continued more actively than most other means of attack on unemployment. A considerable tendency toward federation and consolidation was noticeable among private philanthropic bureaus in New York City. The Jewish bureaus affiliated with the municipal bureau and organized a "placement clearing house" which offered to supply employers with help as needed, for a fixed annual fee. Two of the largest agencies for placing girls, the Alliance and the Vacation War Relief Employment Bureaus, combined as the United Employment Bureau. No new state systems of public employment bureaus were created, but in Maryland, where there had been established previously only one inactive office, more effective work was made possible by authorizing the reorganized labor department to open offices wherever it appeared advisable (Laws of 1916, 406). State bureaus, authorized by 1915 legislation, were opened in California and New Jersey. A feature of the California system was the emphasis on field work by the officials to secure orders from employers. A bureau for the placement of farm labor and for securing settlement by immigrants on farms, set up by the 1916 legislature in the New York Department of Agriculture (Laws of 1916, 586), appeared to many persons an unfortunate duplication of the work of the Industrial Commission. Meanwhile the state public employment bureau had taken over the farm-placement work formerly carried on by the Department of Agriculture and had opened an office in Auburn especially for placing farm hands and one at Mineola, L. I., for help for truck farms. A bill introduced in Massachusetts for reorganization of the state system of public employment bureaus, and for their extension to all cities of over 30,000, failed to pass. Important influences making for uniformity in the work of state and municipal offices include the annual meeting of the American Asso-

ciation of Public Employment Offices, whose proceedings for the three years of its existence were published by the Federal Bureau of Labor Statistics. The monthly publication by the same Bureau of the statistics of the work of the various public offices throughout the United States has also been helpful.

The Federal Department of Labor found work for a larger number of persons during the year and extended its coöperation with local offices, both state and municipal. In 1916, during the first six months, 122,750 applications for work were received and 62,009 placements were made. Comparison of the five months beginning February, 1915, when the work was started, with the same period in 1916 shows 94,482 applicants in the former period and 107,735 in the latter, while placements increased from 16,974 to 58,590. The municipal exchange at Tacoma, Wash., became a joint Federal-city bureau; at Minneapolis cooperation between city, state and nation was arranged; and plans for a closer connection between state and Federal systems in New Jersey have been discussed. Important bills were introduced in Congress for extending Federal powers in connection with the placement of labor but none was brought to a vote. An extension of the employment work of the Department of Labor by the creation of a separate bureau within the Department was the chief recommendation in the annual report of the Secretary of Labor for the year ending June 30, 1916.

Public Work.—Public work for the benefit of the unemployed, common throughout the country in 1915, was considered necessary in 1916 only in the Far West, where several projects similar to those of the previous year were started. In the East, however, a certain amount of interest was still manifested in plans for a redistribution of public work which would regularly reserve some projects for times of depression. Plans of this type were set forth by John R. Shillady at the National Conference of Charities and Corrections at Indianapolis in May, by William Hard (*Everybody's Mag.*, Aug., 1916), and by the *American City* magazine with special reference to the depression believed likely to follow the conclusion of the war.

The Idaho "right to work" law (*A. Y. B.*, 1915, p. 423), by which the counties of the state were required to provide 60 days of work annually for unemployed citizens, was declared unconstitutional by the state Supreme Court (28 Idaho 338, 154 Pac. 621, Jan. 8, 1916). The decision was based on the financial provisions of the law and not on its fundamental principles.

Regularization of Employment.—The reduction of unemployment at its source through reducing the turnover of labor in their establishments and through providing steadier work continued to interest progressive business men. The first National Conference of Employment Managers, held at Minneapolis in February, bears witness to the growth of attention to this phase of business management by the creation of separate departments to deal with all employment problems. The proceedings of the conference were published by the U. S. Bureau of Labor Statistics. The Chamber of Commerce of the United States also took up the subject at its annual meeting.

The success of the superintendent of the state employment office in Rochester, N. Y., in providing year-round work for certain seasonal laborers is suggestive of the opportunities in this line open to public employment bureaus. Farmers have been induced to hire laborers for the whole year instead of for eight or ten months. By shifting employees from the custom to the ready-made branch of the men's-clothing industry, the busy season in that trade has also been lengthened. It is planned to apply similar methods in the shoe and other industries.

Unemployment Insurance.—The agitation for unemployment insurance, both as a means of relief and as the best method of exercising financial pressure for prevention, continued during the year though with less vigor. For the first time a carefully worked out unemployment insurance bill was put before an American legislature. This pioneer action was taken through the Massachusetts

Committee on Unemployment, which was organized by the American Association for Labor Legislation. The bill was similar to the English measure, covering selected trades, and proposed to establish a fund made up of small contributions from employers, employees and the state, out of which weekly benefits of about half wages were to be paid in time of unemployment for a maximum of ten weeks annually. Employers were to be encouraged to give steady work throughout the year by a partial remission of contributions in such cases. Representatives of both labor and capital appeared in favor of the bill at the legislative hearing, and the investigation of unemployment insurance was included among the duties of the Social Insurance Commission authorized by the legislature (Laws of 1916, Res. C. 157). Many speakers also appeared in behalf of unemployment insurance at the Congressional hearing on a Federal bill for a social-insurance investigating commission. There is, however, grave danger that this, like other preventive measures which can be started effectively only when there is comparatively little unemployment, will be neglected until the next crisis again finds the country unprepared.

CHARITY

WILLIAM T. CROSS

National Conference of Charities and Correction.—The discussions of the National Conference of Charities and Correction in 1916 were, as usual, of prime importance in the field of charity in the United States. Administration of charity work, however, was only one of several subjects which occupied the attention of the meeting. It is of considerable significance for charity that the dominant idea of the 1916 National Conference should have been the promotion of social programmes. For example, the division on unemployment reported exhaustively on measures of economic and political preparation for the next period of depression in America (see also *Unemployment, supra*). The necessity and requirements of large-scale relief operations likewise seem to have impressed those in attendance upon the conference. This was a direct reflection of conditions accompanying the European War. It was significant also that this organization, which has for many years considered the inebriate chiefly as a ward of the charitable institution or agency, should have turned in 1916 to an examination of the subject of alcoholism as a public issue. The charity-organization division of the Conference gave its attention to such preventive measures as health insurance, coöperative credit, and the organization of social efforts in small communities. A natural development in the year of a general election has been the increasing emphasis upon the importance of social workers' taking part in political discussion.

War Relief.—Sending aid to Europe has settled down into a more serious and extensive business than it was a year ago. "Knitting for the Belgians" during the winter of 1914 now seems to have been a pastime. With the steady demand for aid has come a realization of the colossal machinery that is necessary to carry on relief activities effectively. Early in December the New York *Evening Post* published a list of 50 war-relief organizations in New York City alone. The American Red Cross has published a directory of 32 of the leading organizations such as were described in this section of the YEAR BOOK for 1915 (p. 426). The Carnegie Endowment for International Peace has published a list of 40 organizations, with the total amount given by each up to dates which vary from Jan. 1 to April 1, 1916, the grand total being $28,896,177.36. The items range from $4,400 for the Austrian Relief Fund to $7,000,000 for the Committee for Relief in Belgium. The list is by no means complete, and the expenditures since the period of report have been greater than ever before. One individual is known to have given over a million dollars. It may help to visualize the extent of the war-relief industry to know that from New York City as an organizing center at least 102 central committees

have been launched. One of the foreign-relief societies reports that 5,000 relief organizations of varying size are coöperating with it in various parts of the United States, Canada, Hawaii, Cuba and Bermuda. There is noticeably more coöperation between war-relief societies than there was a year ago. Fraudulent relief undertakings are not so common as one might expect, in view of the opportunities that exist for imposture.

American Red Cross.—The humanitarian efforts of the American National Red Cross, the official relief agency of the U. S. Government, during the eight months of 1916 ending Aug. 31, were largely absorbed by the European War, as was the case in 1915, and very nearly $600,000 was expended in various ways. In war relief the Red Cross concentrated on the shipment of surgical and hospital supplies and from its general fund for this purpose expended $453,585. In behalf of Polish war victims and from a special fund for that purpose the Red Cross spent $58,938. From the Turkish war relief fund it used $50,000. About $11,009 from the Jewish war-relief fund was expended. For Mexican relief and Mexican border relief funds $10,273 was used. Continuing relief for *Lusitania* survivors entailed an expenditure from the *Lusitania* relief fund of $2,191.

From contingent relief funds the following sums were expended for the purposes indicated: relief of China flood sufferers, $1,100; relief of natives, Rota Islands in the Pacific, $500; relief of Arkansas flood sufferers, $2,124.72; relief of Kentucky flood sufferers, $1,200; relief of Natchez, Miss., flood sufferers, $497.73; relief of West Virginia flood sufferers, $100; relief of Augusta, Ga., fire sufferers, $2,000; relief of Hopewell, Va., fire sufferers, $41.11; relief of destitute in Haiti (result of revolutions), $2,380.32; additional Mexican relief at Brownsville, Tex., $40; relief of famine sufferers, Cape Verde Islands, $1,000.

The American Red Cross has experienced a growth in membership from 30,000 in January to approximately 250,000. With the organization early in the year of a military relief department, headed by a colonel of the Medical Corps of the U. S. Army assigned for the special purpose by the Surgeon-General of the Army, the creation of 25 large base hospitals at convenient points in the United States was effected. Carefully selected trained personnel of larger civil hospitals may be mobilized as hospital units in time of war and transferred to the base of operations, where the staffs that have been working together in peace time will continue to work together under war conditions. In this connection a National Committee of Medical Service was organized, which corresponds to the long-existing National Committee on Red Cross Nursing Service. The number of enrolled American Red Cross graduate-nurses throughout the United States has mounted to above 7,000. The permanent Red Cross national headquarters in Washington, a gift of Congress and of individual philanthropists, is nearing completion.

Central Councils of Social Agencies.—A recent form of organization for improvement of the work of charitable societies and institutions which has matured sufficiently to warrant review is that of the central councils of social agencies. Probably without exception these councils have been formed on the initiative of social workers who are concerned with raising the standards and coördinating to a higher degree the activities of the charitable organizations in their communities. Active councils of this type exist in Cincinnati, Cleveland, Columbus, Milwaukee, Pittsburgh, Rochester, St. Louis, Seattle, Springfield, Mass., and elsewhere.

The original charity-organization society in this country, instituted in 1877, stood for the principle of coördination of all charitable efforts in the community. The central council of social agencies goes a step farther and attempts to unify the operation of the agencies whose object is social betterment. These bodies ordinarily hold meetings of semi-public character for the discussion of practical questions, usually of a technical sort. Their main service appears to be in the operation of their subcommittees, under each of which some

group of agencies, such as children's institutions or medical agencies, is classified. Their activities are chiefly of two kinds: on the one hand, the promotion of social-welfare work not falling within the scope of established institutions or which can be handled only through coöperation of two or more agencies; and, on the other hand, the gradual raising of standards of operation of the established agencies themselves. The principle of the central council of social agencies is used in modified form in many places. An interesting variation is the Association of Children's Agencies of Los Angeles County, California.

Endorsement, Chartering and Licensing of Charitable Agencies.—The year has been notable for a tightening of public control over illegitimate and ill-considered types of philanthropy. This is being accomplished both by voluntary associations through their work of endorsement and by government through licensing and the issuance of charters. Approximately 185 chambers of commerce or organizations of similar type in the United States make investigation of local charities for their members or others. A few have some arrangement whereby a certain list of voluntary charities in their communities are certified to the public as having their approval. In many cities without endorsement schemes relationships among private charities tend to be chaotic. There is now a growing demand for national regulation or endorsement, owing to the fact that undesirable out-of-town agencies can operate without much difficulty under the present endorsement schemes.

Licensing and chartering by public authority, usually that of the state, approaches the same problem from another angle. It has been estimated by Robert W. Kelso of Boston that there are about 10,000 active charitable corporations in the United States, possessed of assets amounting to $1,225,000,000, and having an income of $207,000,000 annually. These corporations for the most part have received certification from the secretaries of state of the various commonwealths without close scrutiny of the service they propose to perform, and without any intention of or authority for revising the action after the organization has begun to operate. Those who advocate a reform assert that a private charity is a public trust, and therefore the situation ought to be under the control of some authority especially qualified and empowered to recognize only legitimate agencies. In only seven states, Indiana, Massachusetts and Ohio being leading examples, is there any requirement of examination as to worthiness before the incorporation papers issue. There are 10 states which require the licensing of home-finding and child-caring agencies and boarding houses for infants. The crux of the problem in the matter of licensing and chartering, as contrasted to the act of a commercial body in making a "white list" of legitimate charities, lies in the fact that it is difficult to define the task of examining and approving agencies of a philanthropic character so that these functions can be performed by an administrative body without recourse to the courts. A widely noted case during the year in this connection has been that of a certain agency against the City Charities Commission of Los Angeles. Attack was made on the validity of an ordinance whereby the Commission was authorized to endorse charities in much the same way as is now being done by chambers of commerce, no charitable undertaking being allowed to operate without such endorsement. The Supreme Court of California has decided adversely to the ordinance. A unique enactment is the new statute in Massachusetts providing for the issuance of licenses to agencies conducting "tag days" or similar schemes for charitable purposes.

Public Relief.—The year has witnessed a continuation of the re-examination of public-relief policies which has been going on for some time. Special report has been made upon the practices of outdoor relief in Chicago and Brooklyn. Under the Los Angeles County department of charities and corrections, relief work has been organized according to the typical charity-organization society plan. At Grand Rapids a new char-

ter has been adopted providing for a department of public welfare, the relief division of which represents a complete departure from the customary arrangements of the poor law. The charter provides that, after thorough investigation, if it shall seem desirable to render aid, the public department "shall in each case attempt, through approved methods of social service, to restore the dependent to self support and to maintain at least a minimum standard of living which shall secure physical, mental and moral wellbeing." Another striking example which has attracted public attention is the reorganization of the charities of Westchester County, New York. This began with a reform administration of the county almshouse and with the extension of the authority of the superintendent of this institution so that he might give aid to the poor in their homes.

State Legislation.—The small amount of state legislation respecting public relief includes a provision in Louisiana whereby forfeitures of bonds in certain parishes and cities may be used for poor relief. In New York the commissioner of charities of New York City is excluded from the board that administers pensions for mothers. Maryland has exacted a new statute providing a system of pensions to widowed mothers for the relief of their children (see also *Child Welfare, supra*). Maryland also makes it a misdemeanor for an adult person having a destitute parent and able to furnish support not to do so.

The legislation of the year on general supervision and administration includes a provision in Georgia making it the duty of grand juries, through committees which they may appoint, to visit sanitaria, hospitals, asylums and similar institutions, and make public report thereon. Three states, Louisiana, Maryland, and New Jersey, have arranged for the budget system as a basis for state appropriations, a measure of wide effect upon charitable institutions receiving public support. In Maryland private institutions which receive public money hereafter will be given such support *per capita* for their inmates.

Legislation relative to the deaf and blind includes the authorization of a commission in Louisiana to inquire into the feasibility of establishing an institution for deaf, dumb, and blind negroes, and an arrangement in the same state whereby the school for the deaf and blind will be under the control of the state Board of Education. In Massachusetts the poor-law authorities are required to aid the commission for the blind in the matter of reporting cases which come under their care, and the Commission is required to register cases of seriously defective eyesight and to arrange for home instruction for the blind. In the same state a commission on economy and efficiency is directed to investigate the advisability of pensions for the needy blind. Mississippi has enacted a statute for the prevention of infantile blindness. The state commission for the blind in New Jersey is authorized to use money for purchase of tools, stock in trade, etc., for blind persons, and to give hospital treatment to blind infants.

Interest has developed during the year in several states in codifying and bringing up to date all the laws bearing upon the welfare of children. Among these states may be enumerated Colorado, Connecticut, Illinois, Kentucky, Minnesota, Missouri, Nebraska and Ohio. One of the first developments of this type was a codification of children's laws in Ohio a few years ago. Recently, in connection with the National Conference of Charities and Correction, a committee for standardizing children's laws has come into existence. During the year a state commission on this subject in Missouri has reported. The report relates chiefly to public administration, delinquency, defective, destitute and neglected children, child labor, school attendance, health, recreation, and education. (See also *Child Welfare, supra.*)

XVI. LABOR AND LABOR LEGISLATION

LABOR

JOHN B. ANDREWS

TRADE DISPUTES

The Strike Record.—It is stated on reliable authority that never in the history of the United States were labor troubles more frequent and more widespread than in the year 1916. For the first seven months of the year, when disputes were relatively most common, the U. S. Bureau of Labor Statistics reported 1,947 strikes and 77 lockouts, as against 581 strikes and 73 lockouts for the same period in 1915. While the Bureau drew information from more complete sources in 1916, the difference by no means can be ascribed entirely to that cause. On May 1, when disputes were especially prevalent, over 100,000 persons were involved in strikes and lockouts in New York City alone, 25,000 in Chicago, and thousands more in Pittsburgh, Cincinnati and other industrial centers. The total number affected was probably not far from half a million. Although strikes were most numerous in the metal, clothing and building trades, and among miners and transportation workers, a wide variety of occupations was affected, from unskilled laborers to life-insurance agents, from telegraph boys to jewelers and silversmiths who earned at times as much as $100 a week.

The main cause of this epidemic of strikes seems to have been the unusually favorable position of labor resulting from the European War. The general prosperity of the country, which created an almost unprecedented demand for labor, appears to have originated in war orders in the metal and munition industries (see XIII, *Economic Conditions*). The decrease in immigration, also due to the war, accentuated the scarcity of workers available. Spurred on by the ever-rising cost of living, employees seized their opportunity to demand higher wages, shorter hours, and "recognition of" (that is, the making of agreements with) the union. In the great majority of cases these efforts were successful. It is possible in the following discussion to mention only a few of the largest and most significant of these disputes.

Transportation. — Transportation workers were widely affected by the prevailing unrest. A nation-wide strike of four railroad brotherhoods was barely averted (see *infra*) and strikes were many among street-car employees and among sailors, longshoremen and others engaged in water transportation. Nearly every form of local transportation in New York City was affected by strikes during the year. The series of disputes was begun in April by a strike of 10,000 "muckers," unskilled laborers digging the excavations for the new subways. The men asked $2 a day as a minimum wage instead of $1.50-$1.75. Through the intervention of the Public Service Commission the contractors were induced to grant the demand. During the year New York City twice faced the problem of a traction strike, which, however, in each case proved of slight inconvenience to the traveling public. The first tie-up affected the surface cars only and lasted but three days, Aug. 3-6. The strike began on the suburban lines in Westchester County on July 22, and spread to Yonkers and finally to Manhattan. The strikers' grievances of low wages, excessive hours, and denial of the right to organize were adjusted through the intervention of Mayor Mitchel and Oscar Straus, chairman of the Public Service Commission. The terms of the agreement gave the employees the right to organize but

still withheld official recognition of the Amalgamated Association of Street and Electric Railway Employees; the questions of wages and hours were submitted to a board of arbitration which was to adjust all future grievances; strikers were permitted to return to work without prejudice; conferences between officials of the companies and committees elected by the employees were to be held at frequent intervals.

Alleged violations of the agreement soon led to a second conflict. The Interborough Rapid Transit Co., which operates the subway and elevated lines, was not a party to the agreement, although it has the same directorate as the main surface lines, but voluntarily affirmed its adherence in principle. Soon, however, the Interborough was said to have promoted the organization of a rival union and to have required its employees to sign individual working contracts which ran for two years. The union which had called the first strike demanded that its members be released from the necessity of signing these contracts. The refusal of this request, the discharge of 14 men active in the first strike, and alleged interference in the election of committees led to a second strike on Sept. 7, in which the subway and elevated lines as well as the surface lines were affected. Mayor Mitchel and Mr. Straus placed the blame on both the union and the traction companies for not submitting their differences to arbitration as agreed upon, and asked the strikers for a cessation of the strike pending an adjustment. They upheld the claim made by the men that the agreement of Aug. 6 was binding on all traction lines, since the directors of the New York Railways Co. also controlled the Interborough Rapid Transit Co. The union representatives not only refused to call off the strike when requested by the mayor but threatened to tie up all trades connected closely or remotely with the operation of the traction lines, and if necessary to call a general strike in New York City. The threatened results, however, did not materialize. Even the strike on the subway and elevated lines was not effective, as most of the motormen belonged to another organization and remained at their posts. With the aid of strikebreakers the Interborough was soon enabled to maintain fairly adequate service. The operation of the surface cars was crippled to a somewhat greater extent, while in the suburbs few cars were in operation as late as the beginning of November, as city ordinances forbade the employment of inexperienced motormen. The Central Federated Union of the city labor organizations voted for a general strike to begin on Sept. 27 but the call was responded to by only a few thousand men.

Other important street-car strikes took place in Washington and Pittsburgh, where wage increases were obtained; in Portland, Me., and Toledo, Ohio, where recognition of the union was secured from the companies, and in Albany, N. Y., and surrounding towns, where the state Board of Mediation and Arbitration induced the men to go to work pending arbitration of a question of unjust discharge.

Employees in water transportation, such as longshoremen, freight handlers, dock hands, as well as those employed on the boats, as engineers and sailors, were all involved in strikes during the year. The most extended strike was that of the longshoremen of the Pacific Coast who stopped work on June 1. The original issue, an increase in wages, was shifted to the demand for the discharge of strikebreakers, who, the union claimed, were responsible for the killing of two strikers. The San Francisco longshoremen came to an agreement with their employers on July 20, but the other strikers did not reach a settlement until October. The terms of settlement were not made public.

A strike of government employees took place, April 22-29, among laborers working on the construction of the government railroad in Alaska. A commission appointed to investigate their claims for higher wages precipitated the strike by delay in filing its report. Federal mediators effected a compromise settlement.

Garment Trades.—Nearly all the larger centers of the garment industry were the scene of industrial warfare during the year. In New York City the result was the downfall in the cloak and suit trade, for which

it was originated, of the well-known protocol for the peaceful settlement of disputes (*A. Y. B.*, 1913, p. 416; 1914, p. 420; 1915, p. 431).

A 12 weeks' strike in the men's-garment industry in Chicago involving, according to various estimates, from 6,000 to 25,000 persons was ended early in January. The parties concerned were the Amalgamated Clothing Workers' Union, which had seceded in 1915 from the United Garment Workers, and the employers' association in the trade. The employers' association long refused to arbitrate, stating that the union was not a responsible body and represented only a minority of the workers, and that wages were higher in Chicago than elsewhere. The strikers' chief demands included recognition of collective bargaining by the signing of an agreement with the union and establishment of a method of arbitrating differences. These were not secured, though the union believed that through settlement by shop committees in conference with employers, recognition of the union was gained in fact if not in form. A reduction from 54 to 48 hours weekly, however, was obtained without change of wages. The strike was marked by the arrest of more than 1,200 strikers and strike sympathizers and by charges, culminating in a grand jury investigation, that the police were acting in the interests of the manufacturers. On Dec. 12 the Amalgamated Clothing Workers, one of the unions in the men's clothing trade, called a strike of 60,000 workers in New York City. The chief issue involved was the 48-hour week. On the same day the employers' association in the industry announced that it had reached a tentative agreement, conceding a 49-hour week until June 1, 1917, with the United Garment Workers, the rival union in the same field.

The largest strike in the industry during the year affected the New York cloak and suit shops from April to August. The Cloak and Suit Manufacturers' Association followed its refusal to submit to a ruling of the the council of conciliation, appointed by Mayor Mitchel in 1915 (*A. Y. B.*, 1915, p. 431), by a lockout of its 30,000 employees on April 29. The council had ruled that the preferential union-shop clause required the selection not simply of union members but of unionists in good standing without arrears of dues. The manufacturers claimed that the decision infringed on their right to employ and discharge without restriction, the same question which had led to the abrogation of the protocol in 1915. The "outside" shop was also a source of controversy, the manufacturers claiming that because of the easier discipline there the union did not enforce its rules against the small "social" shops in which relatives and friends make up the working force, while the union asserted that manufacturers with union shops were sending much of their work outside to be done under sweatshop conditions. The Manufacturers' Association refused to attend a conference called by Mayor Mitchel for the purpose of averting an open break, and the union thereupon called a general strike in the remaining 1,800 independent shops outside the Association, so that the Association could not have its contracts fulfilled in them. About 650 of these outside firms signed agreements with the union within a comparatively short period.

An attempt on the part of the Manufacturers' Association to resume work on June 1 by declaring the lockout at an end was unsuccessful. The strike had lasted ten weeks when Mayor Mitchel renewed his invitation to a conference, which representatives of the Manufacturers' Association this time attended. Six days' discussion, however, failed to bring about an adjustment. The mayor then joined with 30 prominent citizens in petitioning President Wilson to make a Federal investigation of the dispute. It is alleged that the threatened investigation and also the fact that the busy season had begun were factors inducing both sides to adjust their differences. The tentative agreement abolished the protocol which for six years had provided machinery through its various representative boards for the review and peaceful settlement of differences. Instead, complaints were to be settled by direct negotiation between union and manufacturers and the right to discharge and to strike were unrestricted. Preference to union

members in hiring was retained, a five per cent. increase in wages was granted, hours were slightly reduced, and control of the "outside" shops was attempted through a registration system. The strikers at first showed a disposition to reject the agreement, but after comparatively slight modifications, the most important of which made the Manufacturers' Association responsible for variations of the agreement by its members, raised the prices for work in "outside" shops, and reduced the period of employment necessary for service on a price committee, they were induced by their leaders to accept it and to return to work.

Though the protocol machinery for peaceful settlement of disputes was abandoned in the New York cloak and suit trade where it had originated, it was established as the result of short strikes early in the year among children's dressmakers in New York and dress and waist makers in Boston and Philadelphia. Strikes of wrapper and kimono makers and lace and embroidery workers in New York secured increased wages, shortened hours and preferential union shop, but arbitration boards were not established in these lines. (See also *Arbitration and Conciliation, infra.*)

Metal Trades.—Rioting and loss of life and property marked a strike of iron and steel workers in East Youngstown, Ohio, which began on Dec. 27, 1915, in the Republic Iron & Steel Co. and gradually spread to other steel concerns until 15,000 men were involved. On Jan. 7 a mob of parading strikers congregated near a bridge leading to the plant of the Youngstown Sheet & Tube Co., at the entrance of which company guards were stationed. It is alleged that someone in the crowd threw a stone at the guards, whereupon the latter opened fire, killing three and wounding 18 persons. A night of rioting followed in which looting took place and property was burned. Many strikers were arrested and imprisoned. A ten per cent. increase in wages was declared in all the mills, and the strike was over by Jan. 13. An investigation by a grand jury failed to fix the blame for the riot. Indictments found against five steel corporations, United States, Carnegie and others, for making an unlawful agreement to fix uniform wage rates for labor were later dismissed.

A demand for the eight-hour day led 30,000 workers in the Westinghouse Electric & Manufacturing Co., Pittsburgh, to cease work on April 22. Several clashes between company guards and strikers and a number of street riots necessitated calling out the militia. The president of the company refused to concede the strikers' demand, and further announced on May 8 that those who failed to report for work on the following day would lose the benefits accruing under the company's compensation and pension systems. The men returned to work without gaining their demands.

In April New York militia was called out to quell strike riots among unskilled and semi-skilled laborers at a large munition works in Hastings. A wage increase of two cents an hour ended the 10 days' strike on April 27.

Mines.—A strike in the copper mines of the Clifton-Morenci district of southern Arizona, begun in September, 1915, was ended through the efforts of Federal mediators on Jan. 31. The miners were given a 20 per cent. increase in wages, union organization was permitted, and representative conferences for the discussion of grievances were arranged. Many observers contrasted the absence of serious disorder with the riots and loss of life in Colorado (*A. Y. B.*, 1914, p. 416) under similar conditions involving aliens in isolated mining communities. No effort was made to operate the mines and the militia who were sent to the strike district received orders from the governor not to permit the importation of strikebreakers. The governor explained this order, for which he had no precedent in statute law, on the ground that the importation of strikebreakers always endangered the paramount duties of preserving life and property, and also that it delayed conference and compromise for the adjustment of differences.

Unorganized iron miners on the Mesaba range in northern Minnesota struck in June, their main demand

being the abolition of the contract system by which the wage rate for each piece of work is fixed by a separate bargain between mine boss and miner. It was claimed that this led to extortion of bribes by the mine bosses and to constant uncertainty as to wages. The mine operators, on the other hand, asserted that wages were high and had been increased twice within a few months, that investigation showed no traces of extortion, and that the contract system was a necessary incentive to hard work and satisfactory to most of the men. A considerable amount of disorder accompanied the strike. A strike picket and a deputy sheriff were shot, and several I. W. W. organizers who had come to the Range to help the strikers, together with four strikers, were under indictment for murder when the strike was called off in October.

Agricultural Workers.—Widespread labor troubles among agricultural workers in Porto Rico occurred in 1915-1916, when several thousand workers in the sugar-cane fields engaged in a series of strikes for higher wages and better working conditions (see also VIII, *Porto Rico*). The strikes met with little success. Charges were made by labor leaders that the police were used in the interests of the employers, and that they broke up peaceful meetings of strikers and made unjust arrests.

The Bayonne Strike.—For the second time in 15 months a strike marked by violence resulting in fatalities occurred in Bayonne, New Jersey (*A. Y. B.*, 1915, p. 428). The strike began on Oct. 6 among unorganized, non-English speaking employees of the Standard Oil Co. and quickly spread to other oil and chemical plants. The Standard Oil strikers asked for wage increases of 30 per cent. for those receiving less than $3 a day and 20 per cent. for those receiving $3 or more, the eight-hour day, and "decent and humane" treatment from foremen and superiors. From causes that are not entirely clear violence soon broke out, and within a few hours after the men had gone on strike they were fighting in the streets with the police. Many citizens were then hastily sworn in as special deputies, the saloons were closed, and by an extensive use of force order was quickly reëstablished. The authorities claimed that the strikers formed mobs, kept many men from work who did not wish to strike, and shot at the police. On the other hand, strike sympathizers claimed that the police used unlawful methods and terrorism not merely to secure order but to break up the strike, and that newspaper accounts of violence by the strikers were inaccurate and exaggerated. The strike failed and the men returned to work under the old conditions, except that at the Standard Oil plant the superintendent agreed to confer on their grievances with a committee from among their number.

Boycotts and Blacklists.—Continuing the application of the Sherman anti-trust law to labor unions, for which precedent was set in the Danbury Hatters' Case (*A. Y. B.*, 1915, p. 430), the U. S. Circuit Court of Appeals ruled against the United Mine Workers in two suits brought by the Bache-Denman Coal Companies of Arkansas and by the Pennsylvania Mining Co. Reversing a lower-court decision, the Court ruled that a labor union could be sued as an entity even though unincorporated, and that it could be held responsible for business losses to the employer caused by its attempts to enforce the closed shop, although this was a restraint not of interstate sales, but of production for interstate commerce. The case was sent back to the lower court for trial, where damages of nearly $2,000,000 are involved. (Dowd *v.* United Mine Workers, 235 Fed. 1, Aug. 21, 1916.)

That full advantage is likely to be taken of the liability of such unions for business losses in strikes is indicated by the suit for $50,000 brought against striking iron moulders in Bridgeport, Conn., in August, in which their personal property was attached pending judgment by the court. The Clayton Anti-Trust Act (*A. Y. B.*, 1914, p. 434), intended to prevent suits of this nature, does not seem as yet to have been invoked in this connection.

The American Federation of Labor has tried to raise the amount

($252,130) for which the Danbury hatters were found liable through the gift of an hour's pay from each member, but appears to have obtained only about half the sum needed. A court decision restored to the hatters the accumulated interest on their savings-bank accounts, which had been attached ever since the case first came into litigation in 1903 (230 Fed. 303, Feb. 8, 1916). This case was appealed to the U. S. Supreme Court, where it was still pending at the close of the year.

ARBITRATION AND CONCILIATION

Activity of Government Agencies.—In spite of the unusual frequency of strikes, the year was not without noteworthy successes in the peaceful settlement of labor disputes through arbitration and conciliation. In the 10 months ending Sept. 15, 1916, mediators of the Federal Department of Labor intervened in 158 cases, of which they succeeded in adjusting 102. For the entire year ending June 30, 1915, they intervened in only 32 cases, 19 of which were successfully adjusted. Among the more important disputes settled by Federal mediators were those between the various New England railroads and several thousand office clerks, by conciliators from the Department of Labor, and between the New York Central Lines and 5,000 telegraphers and signal-men, by a board appointed under the Newlands Act. In both instances the employees obtained increased pay and shorter hours. In November a demand of the switchmen on railroads east of the Mississippi for an eight-hour day was submitted to arbitration, also under the Newlands Act. On Dec. 23 the arbitrators filed a decision granting the switchmen an eight-hour day with pay on a nine-hour basis.

Agreements in the Anthracite and Bituminous Coal Industries.—Important trade agreements were negotiated in the anthracite and bituminous coal industries. Eleven demands of the anthracite coal miners, chief of which were the reduction of hours from nine to eight, 20 per cent. increase in pay, and complete recognition of the union, including the closed shop and the "check-off" system or collection of union dues by the operators, led to lengthy negotiations. A compromise agreement, which terminates in 1920, granted the eight-hour day with three to seven per cent. wage increases, but gave no further recognition to the union than making it one of the parties to the agreement, as had been done in 1912. The willingness of the operators to negotiate with the miners and the continuance of work by the miners for a month after their old agreement had expired, while negotiations were going on, was considered by impartial observers to show a desire to preserve industrial peace which indicated a changed spirit in the industry since the bitter strikes of 1900 and 1902.

The bituminous coal miners gained in their agreement a general five per cent. wage increase, payment on the mine-run system, and complete recognition of the union, but they were denied the demand for the eight-hour day from bank to bank, that is from the moment of entering the mine to the time of emerging from it. The miners asserted that all travel underground to the particular place to be worked ought to be reckoned a part of the day's work. Dissatisfaction with the contract was manifested by the Pittsburgh miners, who went on strike and threatened to secede from the organization but were finally induced by union officials to ratify the agreement.

The Eight-Hour Day for Railroad Trainmen.—Collective bargaining on an unusually large scale took place in the conferences between 25 railway managers acting for more than 200,000 miles of railroad and the chiefs of the four great railroad brotherhoods, locomotive engineers, engineers and firemen, railway conductors, and railway trainmen, comprising about 400,000 men. The men asked for the "basic" eight-hour day, with overtime at the rate of time and a half for all longer hours. Railroad officials asserted that this substitution of eight for 10 hours as the standard day's work and the unit for pay was merely a demand for higher wages, since hours in railroad train service could not be shortened. The

employees contradicted this statement, claiming that an increase in the average speed of freight service from 10 to 12½ miles an hour would produce the necessary reduction. As no agreement could be reached after extended conferences, the railway managers suggested arbitration but the union leaders refused, declaring that the eight-hour day was not arbitrable. When a deadlock between the contending factions became apparent President Wilson invited the conferees to Washington. He proposed that the eight-hour day be granted but with overtime at *pro rata* instead of higher rates, promising that he would use his influence to secure a Federal commission to investigate and report the results of the change and any necessary measures of relief. This was favored by the union leaders but unanimously rejected by the railway officials on Aug. 26. A country-wide railroad strike was then called for Sept. 4.

To avert what seemed to many a national calamity, the President on Aug. 29 turned to Congress and asked for the adoption of six measures, which were meant not only to solve the difficulty for the time being but to guarantee protection to the public in any similar future controversy. These measures called for the enlargement of the Interstate Commerce Commission; an eight-hour day for all employees engaged in the operation of trains; the creation of a commission to study the effects on the cost of operation; an expression of approval by Congress if the findings of the Interstate Commerce Commission justified an increase of freight rates; a provision, similar to the Canadian Industrial Disputes Act, making all railway strikes unlawful until official investigation had been made; and a provision empowering the President to draft railroad employees into service when required by military necessity. On Sept. 2 Congress hastily passed the Adamson Eight-Hour Act which included but two of the measures submitted, the eight-hour day and the creation of the investigating commission (see *Labor Legislation, infra*). The law goes into effect on Jan. 1, 1917, and the commissioners appointed by the President to study its operation are Major-General Goethals of Panama Canal fame, E. E. Clark of the Interstate Commerce Commission, and George Rublee, formerly of the Federal Trade Commission. By the middle of November, however, many of the principal railroads had filed petitions for injunctions to prevent the enforcement of the law on Jan. 1, and the brotherhoods were again threatening to strike if the injunctions were granted or the law was declared unconstitutional. On Nov. 22 Judge Hook of the U. S. District Court at Kansas City declared the law unconstitutional to expedite submission of the questions at issue to the Supreme Court. On Dec. 28 the brotherhood chiefs met the committee of railway managers in conference on differences of opinion as to the payment of increased wages pending the decision of the Supreme Court, but the conference was a total failure. The brotherhood chiefs announced that they would refer the whole situation to their members for a decision on a new strike threat. (See also I, *American History;* and XX, *Railroads.*)

New Protocols in the Clothing Industry.—In the New York dress and waist industry and in the Hart, Schaffner & Marx clothing factories in Chicago, agreements of the "protocol" type, providing for the arbitration of all grievances, were successfully revised and renewed. Under the dress and waist agreement, wages were raised, weekly hours were shortened from 50 to 49, and a "board of standards," made up of nine members, three each from the employers' association, the union and the public, to investigate and settle disputed questions was organized. The board is carrying on a "test shop" where the various operations of garment-making are timed and standardized in the hope of providing a more certain guide to wage bargains on new styles. In February, by means of short strikes, the union extended the terms of the protocol to a number of shops outside the association. At the same time and with the permission of the employers' association, workers in the protocol shops ceased work for a few days to show their sympathy with the strikers in the cloak and suit trades (see *supra*)

and to bring back into the union members in arrears.

The Hart, Schaffner & Marx agreement, which is to run for three years, retained the preferential union shop and the protocol machinery, reduced weekly hours from 54 to 49, and raised wages an average of 10 per cent. under an arrangement by which the largest increases go to the lowest paid employees.

Operation of the Colorado Industrial Disputes Act.—The growing interest in more effective methods for the peaceful settlement of industrial disputes, makes the operation of the Colorado Industrial Disputes Act (*A. Y. B.*, 1915, p. 446) of special importance. The law, which is the closest approach in the United States to compulsory arbitration, authorizes the Industrial Commission to forbid strikes and lockouts until it has investigated and made public report on the situation. During the first year's work under the Act, the Commission was instrumental in securing 82 agreements in disputes, while it affirmed the justice of the strikers' demands in several cases, notably those of the Denver tailors and machinists. Few violations of the law were recorded. The 500 employees of the American Smelting & Refining Co. in Leadville, who struck before investigation, pleaded ignorance of the law and were induced to return to work pending an investigation of their claims; on recommendation of the Commission their wages were increased. Organized labor, however, continues its opposition to the Act and declares it to be an invasion of the constitutional rights and liberties of wage earners.

LABOR ORGANIZATIONS

American Federation of Labor.—The 36th annual convention of the American Federation of Labor was held at Baltimore, opening Nov. 13. The membership was given as 2,071,836 on Sept. 30, an increase of about 125,000 over the preceding year. Forty-five state federations and 27,711 local unions were reported. Plans were made for more active efforts to organize negro wage earners and Oriental immigrants. The convention adopted a resolution favoring congressional investigation of the increased cost of living and went on record in opposition to the issuance of injunctions against unions in labor disputes and to laws prohibiting strikes and lockouts until after government investigation. A working agreement was arranged between the Federation and the four railroad brotherhoods, which have heretofore remained independent, and plans were made for their complete affiliation in the near future.

A tendency toward labor organization among certain classes of professional workers was noticeable in 1916. Public school teachers formed a national Federation of Teachers, affiliated with the American Federation of Labor; the Actors' Equity Association took similar action; the Authors League of America voted to join the American Federation of Labor by a small majority, but gave up the idea on finding that it would probably disrupt the organization. The Federation of Teachers included members in Chicago, Cleveland, and Scranton, Pa., and efforts were made to form a branch in New York City. The Chicago Board of Education continued to oppose the local branch which has been in existence for several years (*A. Y. B.*, 1915, p. 435). The courts upheld an injunction against the enforcement of the Board of Education's rule, passed in 1915, forbidding teachers to belong to labor organizations. The Board then repealed the rule retaining teachers during "meritorious service" and did not re-elect 68 persons, 39 of whom were officers or active members of the Federation. It was claimed that these teachers had given excellent service and were dismissed only because of their union affiliation. In Cleveland the right of the superintendent of schools to dismiss teachers because of union affiliation has not yet been finally passed on by the courts.

Largely as a result of a proposal in Congress to lengthen the working day for government clerks from seven to eight hours, a union of civil-service employees with over 5,000 members was organized in Washington and affiliated with the American Federation of Labor. The scope of the union as chartered was purely local, but a considerable sentiment was said to exist

among the members in favor of forming a national body. It was announced that the union would attempt to secure improvements through legislation and through conferences with officials and would not carry on strikes.

The "Open-Shop" Campaign in California.—An active "open-shop" campaign is being waged on the Pacific coast. The Chamber of Commerce of San Francisco has appointed a law and order committee whose avowed object is the establishment of the "open shop" in which both unionists and non-unionists may be employed without discrimination. The unionists maintain, however, that its object is to compel workers to make written agreements not to join or remain members of any labor organization, and to boycott employers of union labor by refusing to sell goods to them. According to the International Workers' Defense League, a bomb explosion at the San Francisco preparedness parade on July 22, which killed 10 bystanders, was taken by the Chamber of Commerce as a pretext for prosecuting labor men and furthering its open-shop campaign. Five labor leaders were arrested in connection with the affair and the first to be tried, Warren K. Billings, was found guilty but entered an appeal not yet decided. The California State Federation of Labor, although championing the cause of the indicted, passed the resolution "that these are not labor cases and the cases are not part of a general conspiracy against labor."

National Conference Board.—On Nov. 15, 12 large employers' associations, having a labor force of 7,000,000 wage earners, announced the formation of a "National Conference Board." A charge that the organization was a union of employers against labor and labor unions was denied by the Board. Its avowed purpose is the education of employers in the importance of the labor problem and of the public and the labor interests in the problems and viewpoint of manufacturers.

Industrial Workers of the World.—The two factions of the Industrial Workers of the World apparently continued to decline during the year. The Detroit branch, or Workers' International Industrial Union, which does not advocate violence or sabotage, was said to have about 2,500 members in February, 1916. There is no record of any special activities carried on by it during the year. The latest available estimate of the membership of the more widely known I. W. W. was made by the Secretary, William D. Haywood, before the Industrial Relations Commission in May, 1915. He stated that it then contained 15,000 members. I. W. W. organizers were active in the Mesaba range strike (see *supra*) and made some attempts to organize migratory agricultural workers in the western states. In November six persons were killed, 50 wounded and several hundred arrested in a struggle between police and I. W. W. members in Everett, Wash. The unionists were attempting to reach the city to hold a street meeting, a right for which they had been contesting with the authorities for some time.

Woman's Trade Union League.—An interesting development of the work of the Woman's Trade Union League, whose special field is the organization of women workers, is its "School for Active Workers in the Labor Movement." The school provides a year of academic study and field training for women labor organizers. The League has long been unable to supply the demand for these workers.

Affiliation with Mexican Unionists.—Steps were taken during the year to bring American labor organizations into closer connection with Mexican and South American unionists. At the end of June, when, following the Villa raid and the Pershing expedition, war with Mexico seemed imminent (see I, *American History*), the executive committee of the American Federation of Labor held a conference with representatives of Mexican unions, in the hope of bringing about closer coöperation between the organized workers of the two countries and of aiding to maintain peace. Two of the Mexican delegates were authorized to travel through Central and South America for the purpose of promoting a Pan-American Federation of Labor.

Conviction of Chicago Union Officials.—Fourteen business agents of the Painters' and Electrical Workers Unions in Chicago were found guilty

of extortion on June 19. The evidence showed that collections ranging from $50 to $200 had been levied on contractors and storekeepers under the threat of property destruction.

Court Decisions.—Few court decisions of the first importance on labor matters were handed down during the year, though several significant cases are now pending before the courts. One of the most noteworthy decisions was that in which the Massachusetts Supreme Court declared the state anti-injunction law in violation of both state and Federal constitutions (Bogni *et al. v.* Perotti *et al.*, 112 N. E. 853, May 20, 1916). The act was held to limit the right of free contract through limitation under certain circumstances of the right to labor, labor being classed as a property right. It also denied the "equal protection of the laws" guaranteed by the Fourteenth Amendment of the Federal Constitution in that it took away the injunction as a means of preventing damages at times when no other legal remedy was available. The case which, curiously enough, arose from a dispute between rival labor unions, was appealed to the U. S. Supreme Court. The final verdict will be of much significance to the labor movement, since the Clayton Anti-Trust Act (*A. Y. B.*, 1914, p. 434) contains provisions similar to the Massachusetts law and since the American Federation of Labor, in order to stop the alleged abuse of injunctions during strikes, is advocating and working for the adoption of this type of law in a number of other states. (See also IX, *Law and Jurisprudence.*)

A reversal of the results of the election for sheriff and other officials in Huerfano County, Colorado, by the state Supreme Court has a close bearing on the causes of the strike in the spring of 1914, in which it was necessary to send Federal troops to quiet the region (*A. Y. B.*, 1914, p. 416). The Court found that in the November election after the strike, election precincts were formed coterminous with the "closed camps," that is, towns entirely owned by the mining corporations. Through the use of their employees as election officials, exclusion of persons not desired, prevention of political meetings, and control of illiterate voters, the Court stated that "the public election districts and the public election machinery were turned over to the absolute domination and imperial control of private corporations and used by them as absolutely and privately as were their mines to and for their own private purposes. . . . No more fraudulent and infamous prostitution of the ballot is conceivable." Because of such evidences of fraud and illegal practices a majority of the judges of the Supreme Court ruled that the vote of the "closed camps" should be thrown out, which action reversed the results of the election. (Neeley *v.* Farr, 158 Pac. 458, June 21, 1916.). (See also IX, *Law and Jurisprudence.*)

A definition of the scope of interstate commerce by the Supreme Court of South Carolina is of special interest in view of the growing reliance on Federal control of interstate commerce as a method of labor legislation. The Court ruled that an interstate railroad is liable for injuries to an employee caused by failure to provide safety appliances on railroad cars used upon a highway of interstate commerce as required by Federal law, even though the injured employee was not himself engaged in interstate commerce (Texas and Pacific Ry. Co. *v.* Rigsby, 36 S. C. 482). The constitutionality of requiring the provision of such appliances was not considered.

The Supreme Court of Wisconsin declared unconstitutional the law giving the state Industrial Commission power to regulate women's hours of work on the ground that it was a delegation of legislative authority (State *v.* Lange Canning Co., 157 N. W. 777, May 2, 1916). This decision, however, was reversed by the same court after a rehearing in November. The final decision leaves unhampered the rapidly developing industrial-commission movement, under which the body administering the labor law makes specific regulations to carry out a general purpose expressed by the legislature.

Not for several years have there been so few important court decisions on protective labor laws as in 1916. The U. S. Supreme Court ordered a reargument of the well known Oregon

cases involving the state minimum-wage law and the ten-hour law for general employments. The decisions on these cases will determine the status, under present constitutional restrictions, of minimum-wage laws and of laws restricting men's hours in general employments. In each case an extended brief in support of the law was prepared by Louis D. Brandeis and Josephine Goldmark, emphasizing, as did their briefs in successful defense of various women's hour laws, the conditions believed to necessitate the legislation rather than technical questions at law. (See also IX, *Law and Jurisprudence.*)

INDUSTRIAL INVESTIGATIONS

Bureau of Labor Statistics.—The Federal Bureau of Labor Statistics carried on investigations along its customary lines in 1916. In addition to the *Monthly Review*, which contains short reviews of investigations, compilations of current statistics and the like, several bulletins were devoted to data on union scales, wage rates, and wholesale and retail prices, in continuance of figures collected by the Bureau for several years past. The Bureau also continued its activities in the field of industrial hygiene, such publications including a "Report of the British Departmental Committee on the Use of Lead in the Painting of Buildings" which deals with lead poisoning, and a comprehensive report on "Anthrax as an Occupational Disease." Shorter papers on like topics in the *Monthly Review* cover "Industrial Anilin Poisoning in the United States," a disease which has appeared since the recent growth of the American chemical industry, and "Miner's Nystagmus," an eye disease caused by work in darkness.

Investigations Made for the Commission on Industrial Relations.—Congress authorized the printing of additional copies of the main report of the Industrial Relations Commission but made no appropriations for printing the numerous unpublished investigations made for the Commission. However, studies for the Commission of *Scientific Management and Labor*, by Robert F. Hoxie, and *Mediation, Investigation, and Arbitration in Industrial Disputes*, by George E. Barnett and David McCabe, have been published (Appletons). The former report, drawn up with the collaboration of Robert G. Valentine for the employers and John P. Frey for the employees, was made after an extensive study of shops practicing scientific management and emphasized the improvements in production and the possibilities of overstrain and the breakdown of craft skill and collective bargaining under the system. It is announced also that the investigations for the Commission of the economic condition of American industrial workers by W. Jett Lauck and Edgar Sydenstricker, and of the turn-over of labor by Solomon Slichter, are soon to appear.

Report of the Colorado Coal Commission.—The Colorado coal commission appointed by President Wilson in 1914 (*A. Y. B.*, 1914, p. 417) reported briefly in February, its findings being based largely on a personal visit to the Colorado coal fields. The report is concerned principally with conditions after the strike disturbances, and emphasizes two new developments: the creation of the Colorado Industrial Commission, with authority to forbid strikes and lockouts until after investigation and report; and the plan of the Colorado Fuel & Iron Co. for regulating the relations between the corporations and its employees. The commission found the chief disturbing element in the situation to be the fact that all the 400 indictments found after the strike were of strikers, although many persons felt that acts equally illegal with those of the strikers had been committed by representatives of the mine operators. However, the more recent dismissal of many of these indictments by the courts has in part removed the ground for the criticism.

Publication of State Labor Reports.—With the centralization of state labor-law administration in industrial commissions, a marked improvement in the standard of publication for state labor reports has been noted. Recent examples of this change may be found in Ohio and Pennsylvania. The inadequate general statements, almost devoid of statistical data formerly published as annual reports,

have given place in Ohio to bulletins published at intervals throughout the year, including data on industrial accidents, the work of the public employment exchanges, and especially valuable figures, taken from establishment payrolls, on wages and numbers employed by months in the various industries of the state. The Pennsylvania Department of Labor and Industry issues monthly bulletins of current information on the industrial problems of that state. The New York Industrial Commission also has adopted the custom of publishing monthly bulletins dealing with its own work, current statistics and similar matters. The Oregon Industrial Welfare Commission published a report by the chairman of the Commission, Father Edwin C. O'Hara, on the state minimum-wage law, which he considers a highly effective part of a general programme for establishing minimum standards of wellbeing for the workers. The report also included the rulings of the Commission to Sept. 1 and extracts from state court decisions upholding the minimum-wage law.

Municipal Investigations.—The New York City Department of Health has made an industrial investigation of a somewhat unusual type, covering the working conditions for office workers in a downtown city block. Many cases of poor lighting and ventilation were found.

SOCIAL INSURANCE

Progress of the Movement.—The American social-insurance movement, which for several years was practically confined to the field of workmen's compensation, in 1916 continued to show a wider range. A state investigating commission, the second in America, was created by the Massachusetts legislature (Res. 1916, Ch. 157) while the California commission (*A. Y. B.*, 1915, p. 438) continued actively at work preparing its report for the 1917 legislative session. Serious consideration was given similar measures by the New York legislature and by Congress, while bills for health-insurance legislation were before three states. In the fall of 1916 the appearance of social-insurance planks in several party platforms, including the Republican in Wisconsin and both Republican and Democratic in Massachusetts, emphasized the probability of legislative action in the near future. In December, the International Association of Industrial Accident Boards and Officials, which is an organization made up of the officials administering workmen's compensation laws, arranged a Conference on Social Insurance, which was held in Washington, D. C., and which discussed a wide range of problems connected with the various branches of social insurance.

Workmen's Compensation.—In addition to new laws and official investigating commissions (see *Labor Legislation, infra*, and XIV, *Property and Casualty Insurance*), a significant indication of the general acceptance of the principle of compensation for work accidents was the formation of an unofficial "conference" on workmen's compensation in Missouri, one of the few industrial states which still lack compensation legislation. The conference has secured the cooperation of the various interests affected, which have agreed on the draft of a bill to be presented to the 1917 legislature.

The expected final decisions by the U. S. Supreme Court on the constitutionality of the compulsory laws of New York and Washington and the optional laws of Iowa and New Jersey were not rendered. Instead, the Court in November returned the cases for reargument. State supreme courts upheld compensation laws in California, Kentucky, Oklahoma and Pennsylvania (see also IX, *Law and Jurisprudence*).

One of the most important unsettled questions under state compensation laws is the conflict of jurisdiction between the Federal liability law and the states on the question of liability for injuries to employees of interstate commerce carriers. This problem was discussed at the annual meeting of the International Association of Industrial Accident Boards and Commissions, where it was suggested that Congress should end the difficulty by divesting injuries to such employees of their interstate character when they occurred in states hav-

ing compensation laws. The Pennsylvania Workmen's Compensation Commission, however, in publishing a list of pending appeals of that nature, on all of which it is postponing action until the U. S. Supreme Court makes a decision on the subject, recommends the entire repeal of the Federal Act. (See also "Court Decisions," *supra.*)

Antagonism between state compensation insurance funds and the private casualty companies which write this form of insurance continued to be shown in 1916. In Ohio the Supreme Court sustained a ruling of the attorney-general permitting private companies to do business in this field (*A. Y. B.*, 1915, p. 437). The controversy then became a political issue in the 1916 campaign and the victorious candidate for governor was pledged to make compensation insurance a state monopoly. Meanwhile the case was appealed to the U. S. Supreme Court. After visits to the various states having compensation laws, an official investigating commission from British Columbia reported in favor of monopolistic state insurance.

Health Insurance.—Among the various forms of social insurance, the health-insurance movement has made especially rapid progress during the year. The Massachusetts commission created by the 1916 legislature (see *Labor Legislation, infra*) has been directed to draw up a health-insurance bill for submission to the legislature in 1917. Health-insurance bills modelled on the standard measure of the American Association for Labor Legislation were introduced in 1916 in three states, Massachusetts, New York and New Jersey.

A lively interest and, on the whole, a preponderance of favorable opinion were shown by the various groups interested in health-insurance legislation. The medical and public-health societies were somewhat divided on the administrative details of health-insurance plans, but were practically unanimous in support of the general principle. A favorable report by the industrial betterment committee of the National Association of Manufacturers, representing the attitude of an influential group of employers, was matched by favorable resolutions by many labor organizations, including the Typographical Union, the United Textile Workers, Steam and Operating Engineers, and state federations of labor in Massachusetts, Missouri, Nebraska, New Jersey, Ohio and Wisconsin. On the other hand, certain trade unionists of the so-called conservative wing of the American Federation of Labor, chief among whom was its president, Samuel Gompers, opposed compulsory health insurance as a dangerous abridgment of human liberty. The favorable attitude of social workers was evidenced by the general acceptance of health insurance and a demand for a detailed workable plan by the 1916 session of the National Conference of Charities and Correction at Indianapolis (see also XV, *Charity*). Insurance interests naturally took a conservative position and emphasized the need of developing present forms of industrial insurance (see also XIV, *Property and Casualty Insurance*).

Important publications dealing with health insurance have been issued by the American Association for Labor Legislation and the U. S. Public Health Service. The former brought out a detailed brief for health insurance and a third edition of its standard bill, including for the first time arrangements for the payment of physicians, while its annual meeting in December was largely devoted to the discussion of this subject. A noteworthy report by the Public Health Service was "Health Insurance, Its Relation to the Public Health," which took up the need for legislation as well as suggestions for a bill (see also XXVII, *Public Health*).

Old-Age Pensions.—An organized movement for state old-age pensions was started in Ohio by the formation of an Old-Age Pension League, which plans to secure action on a law through the initiative and referendum. Large corporations continued to show a tendency voluntarily to provide retirement systems for their employees. Among firms making such pension systems were Swift & Co., the Chicago meat-packers, and the Interborough Rapid Transit Co. of New York City. Both allowed pen-

sions after 25 years of continuous service, and Swift & Co. also provided pensions for the dependent widows and children of deceased employees. The careful actuarial calculations necessary for successful old-age pension systems are suggested by the report of the New York mayor's commission which had been studying the various funds for city employees. The report pointed out that the nine separate retirement funds "lack uniformity, soundness of financial provision, and in some cases are uncertain with respect to future benefits to participants." The California and Massachusetts Commissions on social insurance held hearings and prepared reports for their respective legislatures in 1917.

Profit Sharing.—Investigation of profit sharing and experiments along this line started in 1916 do not show that it is likely to have the important influence on the industrial system which some students have expected. A comprehensive report on the subject was issued by the National Civic Federation. The investigators found that trade unionists were unanimously opposed to it on the ground that it results in discouraging collective bargaining, while the opinions of employers varied. American, English and French experience both past and present was studied in some detail. It was found that a large proportion of plans tried had been given up after a few years.

Several of the principal "profit-sharing" systems started during the year were not examples of true profit-sharing. Sears, Roebuck & Co. attempted to encourage savings by reserving five per cent. of the Company's net earnings for bonuses to those employees who saved five per cent. of their earnings. The Underwood Typewriter Co. arranged a plan by which employees could buy stock on favorable terms. The Consolidated Gas Co. of New York and the New York Edison Co. and affiliated companies, however, announced on Nov. 22 a plan whereby employees receiving less than $3,000 a year will share in profits to the extent of seven per cent. of their earnings, this being the rate of dividend paid to stockholders of the companies.

SAFETY, HEALTH AND COMFORT

Safety.—The interest in greater industrial safety, so noticeable during the last few years, continued to be manifested in 1916. Several organized safety movements were developed under the direction of state labor bureaus. In Pennsylvania a special committee of the state Industrial Board was established to pass on models and make a complete list of safety devices, and conferences of physicians dealing with industrial problems were held under the auspices of the Department of Labor and Industries. The New York Industrial Commission called an Industrial Safety Conference for December to consider standards for factory safety and also issued a bulletin on the subject. An industrial-safety exhibition was held at Columbus, Ohio, under the direction of the safety director of the Ohio Industrial Commission.

Progress was made also in drawing up codes for industrial safety, often by representative committees of employers, employees and experts. In Ohio a representative committee was chosen to draft new industrial-safety regulations. Safety codes adopted in California in 1916 covered mines, elevators, electrical installations, boilers and general orders. The Pennsylvania Industrial Board adopted 18 codes for safety during 1915 and 1916. Its complete safety codes for the electrical and textile industries were said to be the first in America covering these lines. Representatives of the New Jersey Labor Department are coöperating with the officials of Pennsylvania in the preparation of the codes for the manufacture of explosives, paints and chemicals, and it is expected that these codes will be adopted simultaneously in the two states.

The gift of certain Bryn Mawr alumnae to the college of a fund for the organization of a Fire Prevention Committee reflects the extent of the "safety-first" movement. This committee, which is empowered to cooperate with state officials and to employ a trained secretary, has already done effective work in forcing a large department store in Phila-

delphia, which has long failed to observe fire laws, to make structural changes that minimize the hazard. The Mine Inspectors' Convention held in Washington, Feb. 24 and 25, was concerned with the standardization of accident statistics and legal regulations concerning safety in mines. The fourth conference of the National Safety Council in Detroit, Oct. 17-20, with its slogan of "universal safety," also illustrates the present wide scope of safety work. The Council met in 15 sections and discussed in these meetings measures tending to greater safety in mills, factories, mines, railroad and marine occupations, and in the home and public places.

At the first safety exhibit in the new National Museum in Washington, which took place in May, safety measures for the protection of industrial workers were included. The Government also sent out a train to tour the country with a safety exhibit.

Health. — An occupational-disease clinic was opened in Philadelphia on June 1 through the coöperation of the Labor Department and the professors of medicine in the University of Pennsylvania. Individuals will be treated and general investigations will be made. The findings of the specialists are expected to have a direct bearing on the awards of the workmen's compensation committee in cases involving occupational disease. The comparative lack of activity in the field of industrial sanitation is noteworthy and suggests the question, whether the enactment of health-insurance legislation would not be as compelling a force for an organized health movement as accident compensation has been in the "safety-first" campaign.

Comfort.—The Federal Bureau of Labor Statistics has begun an exhaustive investigation of welfare work, which it defines as anything done for the employee's comfort beyond the payment of wages and the requirements of the law. A preliminary form was sent to 1,250 establishments from which as complete returns as possible will be obtained. An intensive study will then be made of the most satisfactory types in each branch of welfare work.

In Detroit the welfare department of the Chamber of Commerce has established a permanent welfare exhibition to which more than 30 plants have sent exhibits of the work carried on in their own establishments.

WAGES, HOURS, AND COST OF LIVING

Hours.—The movement for the eight-hour day continued in 1916. Perhaps the most important groups of workers attaining it during the year were the 175,000 anthracite coal miners, who were granted an eight-hour day in their new four-year agreement, and the railroad brotherhoods whose demands were finally gained through congressional action (see *Arbitration and Conciliation, supra*). In the machine trades, especially in war-contract firms, the general advance towards the eight-hour day was particularly noticeable in the plants in and about Springfield, Mass., Perth Amboy, N. J., Toledo, Ohio, and New York City. It has been estimated that some 300,000 workers gained the eight-hour day during the 12 months ending June 1, 1916, either through collective action or through the voluntary action of employers. In no case has the reduction of hours been accompanied by wage decreases, and in many cases, for example among the anthracite coal miners, there has been a substantial increase.

A country-wide movement for an eight-hour day for women by means of legislation has been organized. After the Massachusetts legislature refused to pass an eight-hour law on the ground that the state would suffer in interstate competition, women from all the New England states held a conference to plan for the simultaneous introduction in these states of legislation similar to that rejected by Massachusetts. The movement has spread. Under the auspices of the Woman's Trade Union League and the National Consumers League, conferences have been held in Chicago, Wilmington, Del., New York City and Springfield, Mass., all of which adopted resolutions urging the delegates to promote the passage of laws establishing the eight-hour day and 48-hour working week for women by the 40

legislatures in session in 1917, and approving the introduction in Congress of a Federal eight-hour bill for women similar to the Federal child-labor law (see *Labor Legislation, infra*).

Wages.—Wage increases have been frequent throughout the year, an especially large number being announced on Jan. 1 and May 1. A bulletin of the New York State Industrial Commission, based on figures from 1,500 manufacturing establishments employing over 500,000 workers, showed that average weekly wages had increased 22 per cent. from $12.26 to $14.93 between October, 1914, and October, 1916. The chief occupations affected were mining, the iron and steel business, common labor, machinists (especially ammunition works), and the textile industries in the North. A tabulation of the increases effective May 1 showed that approximately 700,000 workers were affected, and that the total increase in monthly pay roll was approximately $5,000,000. The increases announced varied from 5 to 30 per cent. The latter amount was granted by the United States Steel Corporation in three increases of 10 per cent. each. A number of the increases were obtained through strikes or collective agreements, others were necessary in order to secure labor, and many were granted to forestall labor troubles or because of the unusual prosperity of the business. Late in November and in December many additional wage increases were announced because of the increased cost of living. A number of special bonuses to clerical employees in banks and similar institutions were also announced at that time.

Cost of Living.—It is questionable, however, if the increase in cost of living during the year did not exceed the rise in wages. The *New York Times Annalisi* index number shows the fluctuation in the wholesale price of "25 food commodities selected and arranged to represent a typical family's food budget." The base, or 100 per cent., is the average price of each commodity during the decade 1890-1900. According to this method of measurement the cost of living was extremely high in 1916. The lowest point in 1916 was above the highest for 1915, which was itself abnormally high. The usual summer decline in food prices did not occur in 1916. The index number during the first 11 months of 1916 stood as follows:

January	153	July	170
February	158	August	177
March	162	September	186
April	166	October	190
May	169	November	205
June	166	December	207

An interesting comparison may be made between the *Times Annalist* index number of wholesale prices and the U. S. Bureau of Labor Statistics index number of the retail price of food. The latter compares average retail prices obtained from 725 retail dealers in the 44 principal industrial cities of the country with the average price for the year 1915. The index number of the U. S. Bureau of Labor Statistics for the first ten months of 1916 stood as follows:

Jan. 15	106	July 15	109
Feb. 15	104	Aug. 15	112
Mar. 15	105	Sept. 15	116
Apr. 15	107	Oct. 15	119
May 15	96	Nov. 15	124
June 15	109		

It showed a less decided rise than the *Times* index number but its general course was similar.

One noticeable feature of the fluctuations in the cost of living was the rise in the price of wheat ascribed to the short crop and large exports to the warring countries. This caused a rise in bread prices similar to that which occurred in 1915, without, however, the subsequent reduction, so that by October many bakers charged six cents for loaves formerly sold for five cents and further increases were rumored. Cotton also was rising, threatening an increase in the prices of clothing, and in New York City coal had reached the unusual price of $12 a ton. The New York Association for Improving the Condition of the Poor stated as a result of investigation that the cost of foods ordinarily purchased by working-class families averaged 30 per cent. higher in November, 1916, than in November, 1915. (See also XIII, *Economic Conditions.*)

LABOR LEGISLATION

IRENE OSGOOD ANDREWS

Administration of Labor Laws.—The labor departments in New Jersey and Maryland were reorganized in 1916. In Maryland a state Board of Labor and Statistics is created, which combines the former Bureau of Statistics and Information, the inspector of female labor, and the administration of the mothers'-pension law. The Board is composed of three commissioners, appointed by the governor, to serve two years. The chairman receives a salary of $2,500 and each of the advisory members $500 (Ch. 406). In New Jersey the reorganization was largely internal, consisting mainly of forming the existing staff into various bureaus, raising salaries, and slightly increasing the staff. All employees except the commissioner are to be under the classified civil service (Ch. 40); (see also VI, *State Administration*). Amendments in Massachusetts include an act placing the prevention of industrial accidents and occupational diseases with the Board of Labor and Industries (Ch. 308). In New York City the borough superintendents of buildings, instead of the Industrial Commission as formerly, are given jurisdiction over the construction and alteration of buildings, subject to a Board of Standards and Appeals, and the regulation of bakeshops and confectioneries in tenement houses is transferred from the city Department of Health to the Tenement House Department (Ch. 503). The power of citizens of New York to proceed against labor department officials for neglect of duty is limited, but enforcing procedure by the commissioner of labor is expedited. (Ch. 152). The commissioner of labor in Georgia is authorized to appoint an additional factory inspector at $1,200 a year (No. 547).

Child Labor.—A number of states amended their existing child-labor laws, and in most instances raised the standard of protection. No new states were added to the list now regulating child labor, but the enactment of the Federal Government is of especial importance. In Kentucky the child-labor law was amended to permit a non-resident child under 16 to perform in a theatre if his parent or "other adult custodian" remains in the wings and escorts the child to and from the theatre (Ch. 23). In Maryland a number of sections of the Child Labor Act were repealed and reenacted with several changes, the more important being that work in mercantile establishments, stores, offices, boarding houses, places of amusement, clubs, and in the distribution, transmission, or sale of merchandise is added to the list of prohibited employments for children under 14, while the operation of crosscut saws, slashers, or other machines operated by other than foot or hand power, cutting machines, and work in tobacco factories, theatres, or moving-picture establishments, are added to the list of occupations prohibited to children under 16. The age limit at which females may work at employments requiring constant standing is lowered from 18 to 16, while the age at which boys may distribute or sell papers in the street is raised from 10 to 12, excepting that special licenses may be granted boys over 10 to distribute papers on regular routes between 3:30 and 5 p. m. A penalty is imposed for employing, permitting or suffering a child to work, instead of only for employing a child, but the maximum fine is lowered from $50 to $10. Practically all of the penalties for violations or for failure to observe the law are lowered, including the length of terms of imprisonment. The enforcement staff is now four inspectors at $1,000 a year, three officers to issue employment certificates and act as inspectors, and one officer to act as inspector of street trades, the latter at $1,200 a year, instead of seven inspectors and one officer (Ch. 222). Amendments in Massachusetts relate to peddlers' licenses and to summer permits for work, and also provide for "coöperative courses" which permit technical training in coöperation with manufacturing or mercantile establishments (Ch. 95). The New Jersey commissioner of education and the commissioner of labor may grant

to pupils who study part time in vocational schools "age and schooling certificates" to work in factories, workshops, mills, and all manufacturing places, if such pupils are above the age of 14 years. Either commissioner may revoke the certificate at any time without assigning a cause, and nothing in the act may be construed to permit the employment of children more than eight hours a day or six days a week (Ch. 242). In New York the employment of children in connection with the making of moving-picture films is carefully regulated (Ch. 278), and the granting of employment certificates is more closely safeguarded in several important respects (Ch. 465). In Rhode Island also amendments relate to employment certificates, and to physical examinations which now must be made by physicians employed by the state, instead of the state's paying fees for examinations by private physicians as formerly (Ch. 1378). In South Carolina the child-labor law was amended by raising the minimum work age from 12 to 14 in factories, mines, and textile establishments (Ch. 361).

The Federal Child Labor Act provides that no producer, manufacturer, or dealer may ship, deliver for shipment, or transport in interstate or foreign commerce any product (1) of a mine or quarry, situated in the United States, in which within 30 days prior to the removal of the product therefrom children under 16 have been employed or permitted to work; or (2) of a mill, cannery, workshop, factory, manufacturing establishment, situated in the United States, in which within 30 days prior to the removal of the product therefrom children under 14 have been employed or permitted to work, or children between 14 and 16 have been employed or permitted to work more than eight hours a day, or more than six days a week, or after 7 p.m. or before 6 a.m. In the case of a dealer the application of the Act is limited to shipment, delivery for shipment, or transportation from the state, territory, or district of manufacture or production. Prosecution and conviction for a shipment or delivery for shipment is a bar to any further prosecution of the same defendant for shipments or deliveries for shipment before the beginning of the first prosecution. No dealer is to be prosecuted who establishes a guaranty issued by and containing the name and address of the manufacturer or producer, to the effect that the goods were not produced or manufactured under such conditions that their shipment, delivery for shipment, or transportation is prohibited by the act. No person is to be prosecuted if the only employment of a child has been that of a child as to whom, in good faith, the manufacturer or producer procured at the time of employment and has since relied upon and kept on file a certificate showing that employment of the child is not contrary to the Act. The Attorney-General, the Secretary of Commerce and the Secretary of Labor constitute a board to make uniform regulations for carrying out the Act. For the purpose of its proper enforcement, the Secretary of Labor, or any person duly authorized by him, may at any time enter and inspect mines, quarries, mills, canneries, workshops, factories, manufacturing establishments, and other places in which goods are produced or held for interstate commerce. Every district attorney to whom the Secretary of Labor reports any violation or to whom any state factory, mining, or quarry inspector, commissioner of labor, medical inspector, or school-attendance officer, or any other person presents satisfactory evidence of any violation, must cause appropriate proceedings to be commenced and prosecuted in the proper courts of the United States for the enforcement of the penalties for such violation. Any person not complying with the Act is liable to a fine of not more than $200 for each offense prior to his first conviction under the Act, and to a fine of $100-$1,000, or imprisonment for not more than three months, or both, for each offense subsequent to such conviction (Ch. 432, 64th Cong., 1st Sess.).

Factories and Workshops.—In Kentucky the act creating the state Insurance Board provides for a state fire marshal to be appointed by the state auditor for a term of four years. He must call individuals or commit-

tees of various organizations to advise him in making regulations in regard to safety from fire, and in cities the chief of the fire department must inspect all buildings once every six months and in the fire limits every three months. The fire marshal may prescribe the proper safeguards and fix reasonable standards of safety for the installation of equipment or construction of buildings (Ch. 19). Louisiana makes it a misdemeanor knowingly to permit improperly guarded or defective machinery (No. 146). In mercantile or manufacturing establishments in Massachusetts where the nature of the work makes a substantially complete change of clothing necessary, separate lockers or other receptacles with locks must be provided (Ch. 115). In Mississippi canning factories are added to the establishments exempted from the requirements of registration and license (Ch. 95). Passenger elevators in New Jersey must within two years after the act takes effect (March 22, 1916) be furnished with an interlocking device automatically preventing movement of the elevator car until the shaft door is closed and securely fastened; a cumulative penalty and detailed provisions for enforcement and prosecution in case of violation are provided. The commissioner of labor is to enforce the act, except in municipalities, where the approval of the regularly appointed building inspector is sufficient (Ch. 260). In New York several amendments to the fire-protection law were made. The requirement of a fire-alarm signal system and fire drill in certain factories was amended by exempting buildings where every square foot of floor on all stories is protected with an automatic sprinkler system having two adequate sources of water supply approved by public authorities, and in which the maximum number of occupants on any floor does not exceed by more than 50 per cent. the capacity of the exits (Ch. 466). In New York also it is made a misdemeanor for steam or electric railroads to employ, in or about the operation of engines or trains, an engineer, assistant engineer, fireman, engine foreman, hostler, train-man or flagman (excepting flagmen at crossings), who is unable to read the timetables and ordinary English handwriting, or unable to speak, hear or understand English, or to see and understand signals (Ch. 424). In Rhode Island the law regulating automatic sliding gates or freight-elevator shafts is amended (Ch. 1351). In Virginia washrooms and toilets for workmen are required, and the administration of the fire-escape law is made more explicit.

Hours of Labor.—Four states and the United States enacted legislation affecting the hours of labor for men. For public employees Massachusetts, which already had the eight-hour day, provided also for a 48-hour week (Ch. 240), and in New York public contracts are no longer forfeitable at the option of the municipality for violation of the eight-hour law (Ch. 151). For private employments the Mississippi general ten-hour law was amended to permit employees to work not more than 30 minutes additional each day for the first five days of the week, in place of 20 minutes; to permit night workers to work 11¼ hours for the first five nights of the week, beginning with Monday night, and 3¾ hours on Saturday night, all subject to the 60-hour week limitation; and to provide that nothing in the act shall apply to railroads or public-service corporations (Ch. 239). South Carolina regulated the making up of lost time, and limited work to 10 hours daily on certain interurban car lines (Chs. 547, 544), while Massachusetts authorized an investigation into seven-day labor in hotels and restaurants (R. C. 74).

By far the most significant regulation affecting hours of labor for male adults was the Federal Eight-Hour Act affecting railroads. This law provides that, beginning Jan. 1, 1917, and until 30 days after an investigation commission created by the Act has reported, the compensation of employees "for a standard eight-hour workday" on railroads subject to the Interstate Commerce Act, if such employees are actually engaged in any capacity in the operation of trains in interstate or foreign commerce, shall not be reduced below the "present standard day's wages." For all "necessary time" in excess of eight hours (which is de-

clared to be "a day's work and the measure and standard of a day's work for the purpose of reckoning the compensation for services") the pay shall be at a rate not less than the *pro rata* rate. The Act provides for the appointment by the President of a commission of three, at a salary fixed by him, to observe, during a period of not less than six nor more than nine months, the "operation and effects" of the "eight-hour standard workday" and the facts affecting the "relations" between the railroads and their employees. Within 30 days thereafter a report is required to be made to the President and to Congress. An appropriation of $25,000 is made for the work of the commission. Violation is a misdemeanor, penalty $100-$1,000, or imprisonment for not over one year, or both. (Ch. 436, 64th Cong., 1st Sess.) This Act, which resulted from the threat of a general railroad strike, and the constitutionality of which is, at the time of going to press, being contested before the Supreme Court of the United States, is discussed in detail elsewhere (see also Labor, *supra;* I, *The Sixty-Fourth Congress;* and XX, *Railroads.*)

The penalty for violation of the act of March 4, 1907, limiting the hours of labor of railroad employees, is changed from $100-$500 to "not to exceed $500," and the provision that carriers shall be deemed "to have knowledge of acts of their officers" is changed to shall be deemed "to have had knowledge" of such acts (Ch. 109, 64th Cong., 1st Sess.); (see also "Woman's Work," *infra*).

Mines.—In only one state was legislation enacted affecting mines. Virginia amended her Coal Mine Act of 1912 to include the owner among those who must employ a mine foreman to keep watch on ventilating apparatus; and the provision making it the duty of each miner to prop and secure his place and prohibiting his working unless he has sufficient props and timbers is omitted, and a provision substituted prohibiting a miner continuing work in a place "known by him to be unsafe," or which, with ordinary care, he might have so known, but the happening of an accident is not in itself held to be evidence of such knowledge or of lack of ordinary care on his part or of negligence on the part of the company (Ch. 458).

Social Insurance.—Legislation in the field of social insurance is still in America largely confined to workmen's compensation. While considerable discussion has taken place in regard to old-age pensions and unemployment insurance, little has been accomplished in the way of legislation. The pressing need for some method of providing for sickness, as accidents have been provided for, is meeting with increasing recognition throughout the country, and California in 1915 and Massachusetts in 1916 (R. C. 157) created commissions to study social insurance with particular reference to health insurance.

Two southern states still without accident compensation, South Carolina and Virginia, amended their employer's-liability laws with regard to railroads. One other southern state, Kentucky, and the territory of Porto Rico enacted workmen's-compensation laws, making 35 states and territories to adopt such legislation since 1911. In Kentucky the law is elective, with a compensation board of three members at $3,500 a year, appointed by the governor to administer the act; the state is divided into three administrative districts. Compensation is based on a scale of 65 per cent. of weekly earnings but not less than $5 nor more than $12 a week for not over eight years, but the total payment must not exceed $5,000. The employer must provide medical and surgical care with a cost limit of $100. Compensation is increased or decreased by 15 per cent. in accordance with the failure of the employer to provide safety appliances or of the employee to observe safety rules. Alien non-resident relatives are debarred from compensation (Ch. 33). In Porto Rico the act is elective and a Workmen's Relief Commission is created with five members. Standards of actual payment are considerably lower than in most of the states, although the rate for permanent total disability stands at 75 per cent. of average weekly wages for 208 weeks plus $1,500.

Massachusetts, among other minor

amendments, reduces the waiting period for compensation from two weeks to ten days. New Jersey establishes a Workmen's Compensation Aid Bureau in the Labor Department to assist in administering the law (Ch. 54). New York adds several new occupations to those covered by the act, provides for elective acceptance in non-hazardous callings, allows awards for facial or head disfigurement, and slightly increases the compensation scale at certain points, while the fund for additional payments for permanent total disability sustained after partial disability is provided by the payment of $100 by insurance carriers for every case of death where there is no legal dependent (Ch. 622). Louisiana also amends its law in several respects, including compensation for serious disfigurement; the time for giving notice of accident is extended and in many other respects the act is made more liberal (No. 243). In Maryland the definition of "miner" is extended and compensation is allowed to alien, non-resident, dependent widows, children, and parents; among several other amendments, intoxication must be the sole cause of an accident if an employee is to lose compensation (Ch. 597).

The Federal Workmen's Compensation Act for employees of the United States Government now ranks among the most liberal laws of the world. It displaces the inadequate measure of 1908 and applies to all the half-million civil employees. It provides compensation on a scale of two-thirds of wages, not exceeding $66.67 a month, for the total period of disability, with a waiting period of only three days and with all necessary medical care. The Act is to be administered by a Federal Employees' Compensation Commission, consisting of three members appointed by the President at annual salaries of $4,000. An appropriation of $550,000 was made for the year 1917. (Ch. 458 and P. 272, 64th Cong., 1st Sess.; in effect Sept. 7, 1916.) (See also XIV, *Property and Casualty Insurance.*)

Trade Unions and Trade Disputes. —Only three states enacted legislation affecting the conduct and settlement of trade disputes. The boards of arbitration created have the usual powers of investigation but not the power to enforce findings. In Maryland it is made the duty of the state Board of Labor and Statistics "to do all in its power to promote the voluntary arbitration, mediation, and conciliation" of industrial disputes. The Board may, subject to the approval of the governor, appoint boards of arbitration and provide for their necessary expenses and for reasonable compensation to the members (Ch. 406). In Massachusetts the law prohibiting advertisements for laborers in establishments where there is a strike was amended to require a hearing on three days' notice before the determination of whether or not business is being carried on in a normal manner (Ch. 89). The enforcement of this law was transferred from the Board of Conciliation and Arbitration to the state Board of Labor and Industries (Ch. 143). In South Carolina a Board of Conciliation for investigation and arbitration of industrial disputes and strikes, composed of three members appointed by the governor for six-year terms, was created. Compensation is fixed at $10 a day to each member actually employed in the performance of his duties, in addition to traveling expenses. One member shall be an employer, one a member of a recognized labor union, and the third shall be appointed on recommendation of the other two (Ch. 545).

Unemployment. — Few measures were enacted in the field of unemployment, and no progressive new features were developed in the legislation of 1916. The Virginia statute regulating private employment offices was reenacted with several changes. Agencies must be licensed, a register must be kept as prescribed by law, and fees are limited and regulated. The commissioner of labor enforces the act and makes needed rules and regulations (Ch. 168). The activities of "labor agents" are also strictly regulated (Ch. 517). In Maryland and in New Jersey the operation of public employment offices was made one of the functions of the reorganized labor departments, and New York created a Bureau of Farm Settlement in the Department of Agriculture

(Ch. 586). California endorsed the suggestion of the United States Department of Labor that financial aid be granted to unemployed who settle on the public domain. Investigations of unemployment were ordered, in Maryland under the direction of the Labor Department and in Massachusetts under the direction of a social-insurance commission.

The only legislation of the year on the minimum wage occurred in Massachusetts, where the act was amended to provide that the commission hereafter shall consist of one employer of female labor, one representative of labor, and the third may be a woman (Ch. 303). In the 1912 law the only specification as to membership was the permission of one woman representative.

Woman's Work.—No additions were made to the list of states now restricting the hours of labor for women workers, but three states amended existing laws relating to private employments. In Louisiana the exceptions in favor of mercantile establishments for the 20 days before Christmas were struck out, and Saturday-night exemptions were limited to mercantile establishments "in which more than five persons were employed" (Ch. 177). In Maryland overtime in mercantile establishments on Saturdays and before Christmas was regulated (Ch. 147), and in Massachusetts the state Board of Labor and Industries was authorized to determine what employments are seasonal in applying the exception in favor of such employments (Ch. 222).

Wages and Liens.—Corporations for pecuniary profit in Kentucky must pay wages semi-monthly (Ch. 21), while in Louisiana oil and mining companies were added to the employers who must pay wages every two weeks or twice each month (Ch. 108). In Louisiana, also, all persons engaged in the business of loaning money on wages must secure a license and pay a state tax which local authorities may increase (Ch. 102). A lien was placed on railroad beds, tracks, franchises and rights of way (Ch. 98), liens were extended and safeguarded in several other fields, and employers were forbidden to compel employees to purchase from designated concerns (Ch. 188). South Carolina modified its mechanics' lien law and established a weekly pay day for textile plants (Ch. 546), while Massachusetts narrowed the scope of its existing weekly pay-day law by limiting hotels to which the law applies to those "in a city," and placed its administration with the state Board of Labor and Industries. It also amended the law governing the assignment of wages by requiring the wife's written consent (Ch. 208). Virginia protected employers from employees who accept money or property without rendering services as agreed under a contract by making such acts larceny (Ch. 188).

Miscellaneous. — South Carolina strengthened its race-segregation law for textile mills by making violation a misdemeanor punishable by a fine of not over $100 for each offense or imprisonment for not over 30 days or both (Ch. 391). Congress made widely available the report of the Federal Industrial Relations Commission, and under the Fortifications, Army, Navy and other appropriation acts prohibited the use of any part of the appropriation to pay any officer or other person in charge of the work or any employees of the United States Government while making a time study with a stop watch or other time-measuring device on any job; or to pay a bonus to any employee except for suggestions for improvement or economy in operation of a government plant (Ch. 225, 64th Cong., 1st Sess.). The Federal Government also amended the Seamen's Act of 1915 by reapportioning the number and kind of buoys for vessels under 400 ft. in length. Members of the Federal Marine Band are forbidden to furnish music as individuals if they are placed in competition with civilian employees (Ch. 417, 64th Cong., 1st Sess.), and soldiers may not compete with civilians.

XVII. AGRICULTURE, HORTICULTURE, FORESTRY, AND FISHERIES

AGRICULTURE

E. W. Allen

The Crop Year.[1]—The season of 1916 was an off one in the production of staple crops in the United States. Although the total acreage in cultivated crops was but slightly less than in 1915, the aggregate yield was about 12½ per cent. less than in that year; but prices to producers averaged fully 25 per cent. more, serving to give large money value to the production.

The wheat crop was about 40 per cent. less than in 1915, which was the largest of record—over a billion bushels. Spring wheat was less than a half crop, being almost a failure in Minnesota and the Dakotas. Much of it was of poor quality and unfit for milling. The world's wheat crop was short, including that of Canada, Australia, and other important wheat-producing countries; but the surplus in 1915 resulted in a large carry over, which will help out in maintaining the supply. Corn, despite early fears, was nearly an average crop, smaller than that in 1915 but of better quality.

The acreage planted in cotton in 1916 was the fourth largest ever recorded, namely, 35,994,000 acres, and the early indications were for a crop of over 14,000,000 bales. Storms and the boll weevil did great damage, reducing the average yield to about 156 lb. per acre and the estimated total production to 11,637,000 bales of 500 lb. each. The boll weevil took a heavy toll in Texas, Arkansas, Alabama, Louisiana, and Florida, and did serious damage in portions of Mississippi, Oklahoma, Georgia, and Tennessee. In southern Mississippi and Alabama the crop was practically a failure. The estimates issued early in October resulted in one of the most sensational advances in prices in the history of the cotton market, sending the quotations up to Civil War prices.

Barley, rye, and buckwheat were all below the production in 1915. The potato crop was considerably short of the average and prices were more than double those of 1915. Rice, on the other hand, yielded above the average, and hay, the value of which exceeds that of any other farm crop, was a bumper crop. Tobacco gave a record crop, much above the average. The United States produces more tobacco than any other country for which estimates of this crop are made, British India's crop standing second, and that of Russia third. (See also XIII, *Economic Conditions.*)

Increasing Production.—In an address during the year, President Wilson called attention to the possibility and probable need of doubling the production of staple food products of the United States in the next 20 years to meet increasing needs. It would be possible to do this in many instances but often at a large increase in expense of production, since it would require more intensive methods. The possibility of increasing acre yields is large and farming methods to that end are stimulated by high prices. The opportunity is brought out by some comparisons of the highest yields of the year as reported by the U. S. Department of Agriculture and the average for the country. The largest yield of wheat reported to the Department was 117 bus. and the second largest 108 bus., as compared with the average for the whole country in 1915 of 17 bus. per acre. The largest yield of oats was 184 bus. and the next largest 166 bus.

[1] For the final December estimate of production of the principal crops, see the tables at the end of this department.

the average for the United States being 38 bus. For white potatoes the record yield is 790 bus. and the next highest 743 bus., the average for the country being 96 bus. Such prize yields are rarely commercially practicable on a large scale, but there is much opportunity for bringing up the low yields which at present pull down the average.

Value of Farm Lands and Products.—The average value of farm land was estimated by the Department of Agriculture at $45.55 per acre in 1916, as compared with $40.85 in 1915. In recent years the value of farm lands has increased at the rate of about five per cent., or approximately $2 an acre, per year. The increase has been quite general throughout the United States. For the whole country, the percentage in increased value in the four years since 1912 has averaged 25.7.

The yearly value of agricultural products of the United States has doubled in the past 15 years; in the same period the population of the country has increased one-third. Up to the close of 1914 the imports of agricultural products into the United States increased more rapidly than the exports of agricultural products. In the five-year period 1897-1901, the imports equalled 44 per cent. of the exports of agricultural products; in 1907-1911 the percentage increased to 64, and in 1912-14 it further increased to 75. Abnormal conditions accompanying the European War have greatly stimulated the exportation of agricultural products. (See also XX, *External Commerce of the United States.*)

Agricultural Appropriation Act.—The Agricultural Appropriation Act, approved Aug. 11, made the largest appropriation ever provided for the Department of Agriculture, namely, $26,948,852. It considerably extended and enlarged the functions and activities of the Department. Among other provisions, it materially increased the funds available for marketing studies, for the eradication of the Texas-fever cattle tick in the South (see *Veterinary Medicine, infra*), for combating rabies affecting stock in the Rocky Mountain States, and for the farmers' coöperative demonstration work in the North and West. It inaugurated a market news service for perishable fruits, vegetables, and other farm products, which had been tried experimentally on a limited scale the preceding year (see also *Horticulture, infra*); and it provided for studies and demonstrations of methods for obtaining potash on a commercial scale (see "Fertilizers," *infra*). The Act made available $3,000,000 for additional purchases of lands in the White Mountain and southern Appalachian system for national forests (see also *Forestry, infra*), and authorized the extension of the Weather Bureau's service to the Caribbean region, Panama Canal Zone, and Alaska. There were increases in funds for the campaign against citrus canker and for work upon the white-pine blister rust, provisions for studies in utilizing domestic raw materials in making colors, and funds for conducting extension work in Hawaii and Porto Rico. The Department's established work in the numerous lines it covers was continued on substantially its existing basis, often with increases in appropriation.

The Act carried an unusual amount of new and important legislation. It repealed the Cotton Futures Act of 1914, which had been declared unconstitutional (*A. Y. B.*, 1915, p. 345), and enacted a new act carrying minor modifications. (See also XIII, *The Conduct of Business.*) A Warehouse Act and a Grain Standards Act were also carried in the Agricultural Appropriation Act. The central purpose of the Warehouse Act is to establish a form of warehouse receipts for certain agricultural products, notably cotton, grain, wool, tobacco and flaxseed, which will make these receipts negotiable as delivery orders or as collateral for loans, thus assisting in the financing of crops. The integrity of the receipts is to be secured by licensing bonded warehouses, under conditions which will make the warehouse receipts reliable evidence of the condition, quality, quantity and ownership of the products they cover, with a system of inspection and grading of the products thus stored.

The Grain Standards Act is designed to facilitate the use of more uniform grades in handling grain,

thus enabling the grower to sell his product on its merits, providing an incentive to improvement, and giving greater security to the purchaser through a system of inspection. It marks a new departure in the relation of the Federal Department of Agriculture to business. Under authority of this Act the Secretary of Agriculture has established U. S. standards for shelled corn, effective Dec. 1, 1916. These with slight changes are substantially the same as the permissive standards promulgated in 1914, which have been accepted by many of the grain exchanges. Other standards will be promulgated in time to apply to the next season's crops. The new law does not interfere with the interstate shipment of grain by sample, type, brand or trade name, but prohibits the use of standards other than those prescribed by the Department.

A Division of Agricultural meteorology was established during the year in the U. S. Weather Bureau. In addition to continuing warnings of adverse crop conditions, studies will be inaugurated upon the relation of the environmental factors embraced in climate to the growth of plants and the production of crops, that is, the effect of weather and climate upon the factors of plant growth, including determination of the critical periods in the development of plant life. It is planned to carry on this field work very largely in coöperation with the agricultural experiment stations. (See also XXIII, *Meteorology and Climatology.*)

Farm Loan Act.—The numerous movements for the provision of better credit facilities for farmers resulted in the passage by Congress of an act popularly called the "rural-credit law," which was signed by the President on July 17. It is designed to enable farmers to borrow money on farm-mortgage security at reasonable rates of interest, not to exceed six per cent. and for relatively long periods of time, five to 40 years. Two land bank systems for handling farm mortgages are provided, one operating through Federal district land banks and the other operating through joint-stock land banks. Both systems are to be under the supervision of a Federal Farm Loan Board, which is created in the Treasury Department and composed of the Secretary of the Treasury as chairman *ex officio* and four members appointed by the President. Both classes of banks are authorized to issue debentures or farm-loan bonds of small and large denomination, bearing interest at not to exceed five per cent. per annum, and secured by first mortgages.

The country is to be divided into 12 farm-loan districts and a Federal land bank, which may have branches, established in each district. Each of these Federal land banks must have a capital stock of not less than $750,000, open to subscription by anyone for 30 days, the balance thereafter to be purchased by the Government. The Government's stock, however, is not to draw any dividends and will be transferred at par to associations of borrowers known as farm-loan associations, the plan being that ultimately these associations shall own all the stock in these banks. These Federal land banks may loan on first mortgage from $100 to $10,000 for approved purposes, no loan to be for more than 50 per cent. of the value of the land mortgaged and 20 per cent. of the value of the permanent improvements upon it. The loans are to be made through the local farm-loan associations or, in the absence of such associations, through approved agents. These associations are composed of farm owners and are to be chartered by the Farm Loan Board on recommendation of the district land banks. The associations must be stockholders in the district land banks in proportion to the amount their members wish to borrow, and each member must take stock in his local association equivalent to five per cent. of the amount he borrows. Each stockholder in an association is liable for the acts of that association up to twice the amount of his stock. All proposed loans are investigated and reported upon by an appraiser of the land bank before being made. Loans are to be repaid on the amortization plan, in installments sufficient to meet the interest and pay off the debt within the term of the loan.

The joint-stock land banks comprised in the other system authorized are corporations for lending on farm-

mortgage security and issuing farm-loan bonds which are exempt from taxation. Like the Federal land banks, they are under the supervision of the Farm Loan Board, but the Government does not invest in them, and, subject to certain limitations, they may loan any amount they wish and for any purpose. Their mortgages must provide for amortization payments, and, like the district banks, they can not charge over six per cent. and not more than one per cent. above the interest paid on their last issue of bonds. Both classes of banks are prohibited from charging any fees or commissions other than those authorized by the Act.

Soon after the passage of the Act the President appointed to the Farm Loan Board Charles E. Lobdell, a Kansas banker; George W. Norris, of Philadelphia, a student of economic and sociological questions; William S. A. Smith, of Iowa, a farm-practice expert in the Department of Agriculture; and Herbert Quick, of West Virginia, an agricultural editor and writer, all of whom were confirmed by the Senate on Aug. 3. The Board has held hearings over the country preparatory to districting the country and locating the 12 district land banks, which, it is expected, will be established early in February, 1917.

At the last census over a third of all farms operated by owners in the United States were mortgaged, representing an aggregate indebtedness of about $3,600,000,000. A large part of the loans were for short periods, usually three to five years, thus requiring frequent renewals with attendant expense. An inquiry in 1913 showed that the interest and commissions averaged by states at from 5.3 to 10.5 per cent., with many individual cases far in excess of these figures. Much benefit is expected from the new loan system, which also offers attractive opportunity for safe investment. The interest manifested in the formation of local farm-loan associations indicates the demand for better loan facilities and promises well for the success of the system.

Agricultural Experiment Stations.—The work of the agricultural experiment stations has shown very general advancement throughout the country. The organization of extension work has not only afforded the stations greater opportunity to concentrate their efforts on investigation by relieving them from the numerous calls for advice and information and for popular addresses, which formerly came to them, but has given a new significance and practical application to their work. Already the need of the stations as a supporting agency to the extension divisions is being felt, to provide the new information needed. The revenues of the stations during the year aggregated over $5,285,000, more than $2,000,000 of which was received from direct appropriation by the states; the states are therefore fully meeting the Federal appropriations for this purpose. Their administrative officers and staff members numbered nearly 1,900. Their activity as publishing agencies is indicated by the fact that they issued during the year 1,676 separate publications, aggregating more than 30,000 pages; these were distributed to mailing lists having a total of more than a million names.

Among new special additions to the stations was an appropriation of $100,000 for an auditorium and administration building at the New York Geneva station; a new building for agriculture begun at the Delaware College, to cost $280,000; the authorization of an addition to the Agricultural College building at the University of California, to cost $350,000; and a set of buildings for the citrus substation at Riverside, Cal., on its new permanent site, under way at a cost of $125,000. A tract of about 29,000 acres of land in eastern Idaho, adjoining the Targhee National Forest, has been set aside by President Wilson to be used by the Bureau of Animal Industry as an experiment station for sheep, with general range studies in sheep raising on a large scale. The Ohio Station has started a serial publication, known as the *Monthly Bulletin*, for reporting the work of the different departments of the Station in non-technical form.

Among changes in personnel of the stations were the retirement of Dr. B. T. Galloway as director of the New York Cornell Station, of Dr. E. D. Ball as director of the Utah Station,

and of Prof. R. J. H. DeLoach as director of the Georgia Station.

Agricultural Extension Work.—Much progress was made during the year in perfecting the organization of the permanent national system of extension instruction, and the work attained larger dimensions. In more than 1,280 counties, spread over the entire country, extension agents had been provided and were working regularly, and in addition 450 counties had provided in their organization a woman county agent. As a rule the women agents work with clubs of farm women interested in particular home problems or some farm industry such as poultry, dairying, home gardening, etc. The work among farm women has proved exceedingly popular and is spreading rapidly. Supporting these local forces, there were about 1,500 extension specialists and administrative officers, maintained by the state agricultural colleges and the Federal Department of Agriculture.

The funds for this enormous cooperative enterprise, supplied by the Smith-Lever Act, the Department of Agriculture from its Federal appropriations, the states, counties, and agricultural colleges, amounted for the fiscal year 1915-16 to $4,850,000, and for the year 1916-17 to $6,125,000. The increase came largely from the additional half-million available under the Smith-Lever Act and a corresponding amount provided by the states to meet this annual increase, as required by the Act. Over half the total amount called for in the plans for 1916-17 is to be appropriated for work under the county-agent system, while more than three-quarters of a million dollars is set aside for projects in home economics, and $350,000 for boys' and girls' clubs. The total enrollment in boys' and girls' clubs for the season of 1915 was 105,000 in the 15 southern states and over 209,000 in the northern and western states. The growth in the 1916 season has been quite rapid.

In accordance with a special appropriation made by Congress, an exhibit of the boys' and girls' club work was held in connection with the National Dairy Show at Springfield, Mass., Oct. 10-21. The exhibits included products grown or made by the club members, equipment used, exercises in judging live stock and products, and a wide variety of actual demonstrations by some 200 demonstration teams of boys and girls from 10 of the northern states. This furnished a very interesting and striking illustration of the range and utility of this feature of the extension work.

Marketing Agricultural Products.—Some 15 states have established or provided for official marketing departments. In as many more the extension departments of the agricultural colleges are promoting organization for marketing and taking active part in marketing operations. There are now over 1,100 associations of farmers in the United States for purchasing and marketing. About one-sixth of these are directly coöperative, the balance being governed and profits shared on the basis of capital invested. Many of the latter are being reorganized under new coöperative laws of the states. (See also XV, *Coöperation.*)

One of the most extensive and successful organizations, the California Fruit Growers' Exchange, with its subsidiary Fruit Growers' Supply Co., did a business in 1915 of nearly a half-million dollars. The exchange embraces about 70 per cent. of the fruit growers of the state and comprises 17 district exchanges, 162 shipping associations, and 77 district sales offices. On a non-capital, nonprofit, coöperative basis, it supplies the most comprehensive and efficient marketing service developed for any agricultural crop.

Meetings and Expositions.—The International Soil Products Exposition of 1915 was held at El Paso, Tex., Oct. 14-24, under the auspices of the International Farm Congress, the successor to the Dry-Farming Congress. The latter congress held its sessions Oct. 19-21, under the presidency of W. M. Jardine. The International Irrigation Congress was held at the same place, immediately preceding the Farm Congress. A Federal appropriation of $20,000 was provided to enable the Department of Agriculture and the experiment stations to make an exhibit at the Soil Products Exposition, illustrative of farming methods and results in the sub-humid, arid, and semiarid regions of the country.

At a meeting of state commissioners of agriculture at Washington, D. C., during the summer, the organization of a permanent body was effected under the name of the National Conference of Commissioners of Agriculture. E. J. Watson, of South Carolina, was elected president.

The first National Conference on Church and Country Life was held at Columbus, Ohio, near the close of 1915, under the auspices of the Commission on Church and Country Life appointed by the Federal Council of Churches of Christ in America. Some 40 states and 30 religious denominations were represented and the total attendance was about 700. A notable feature of the conference was an address by President Wilson, who outlined some of the opportunities for social and material development and improvement through coöperation and otherwise. The tenth annual meeting of the Federation for Rural Progress was held in Boston in March.

The National Agricultural Society, a new organization, was formally organized in New York City in April, with James Wilson of Iowa, former Secretary of Agriculture, as president. Many men prominent in national affairs and interested in agriculture, as well as those connected with agricultural institutions throughout the country, have allied themselves with the new society. Up to this time the agricultural organizations of this country have been mainly local, with none corresponding to the Royal Agricultural Society and its anologies on the continent of Europe. This place the new society hopes to fill. It is designed to serve as a clearinghouse for American agricultural interests and agricultural progress. Temporary headquarters have been opened in New York City, but it is planned to make Washington the ultimate home of the society. It has begun the publication of the *Agricultural Digest* as its official monthly organ, to record and interpret the results of investigation and the movements for agricultural advancement.

The National Agricultural Organization Society was formed in 1915 under the auspices of the National Conference on Marketing and Farm Credits, and opened headquarters in Madison, Wis., early in 1916. It is modelled after the Agricultural Organization Society of Ireland, and is designed as a service agency to promote organization and coöperation, and to assist farmers' organizations, providing representation for such bodies, legal advice, and aids to legislation. It will also conduct surveys and train young men as organizers.

The seventh annual Conference on Rural Organization was held at Amherst, Mass., Oct. 16 and 17, the programme embodying a definite plan for organizing the various agencies in Massachusetts for state-wide rural progress, involving the coöperation of a large number of state organizations, boards, and institutions.

The programme of the Section on Agriculture of the American Association for the Advancement of Science, at its meeting at the close of 1915, consisted of an address by the retiring vice-president, Dr. L. H. Bailey, on the "Forthcoming Situation in Agricultural Work," and a symposium on the "Relation of Science to Meat Production," participated in by five speakers, who presented different phases of the question. Dr. W. H. Jordan, of New York, was elected vice-president of the Section.

The Association of American Agricultural Colleges and Experiment Stations held its annual convention in Washington, D. C., Nov. 15-17. A number of scientific societies devoted to special branches of agriculture met prior to or following the convention.

Agriculture in the Pan-American Scientific Congress.—The second Pan-American Scientific Congress, held at Washington, D. C., Dec. 27, 1915, to Jan. 8, 1916, was an occasion of considerable interest to agriculture. Section III, on the conservation of natural resources, was occupied mainly with agricultural topics, relating especially to animal industry, the marketing of agricultural products, irrigation, and forestry. Agricultural education constituted a subsection under education, and matters relating to agricultural meteorology, agricultural engineering, and utilization of agricultural products found place in other sections. Several of the important resolutions adopted by the Congress related to agriculture, among

them the recommendation for an organized live-stock sanitary service in each country, with coöperation between the various countries; the convening of a Pan-American plant-protection conference to plan for international coöperation; the appointment of commissions in the various countries to study irrigation water laws; and a coöperative study by governmental agencies of forest conditions and forest utilization.

Graduate School of Agriculture.—The seventh session of the Graduate School of Agriculture, under the auspices of the Association of American Agricultural Colleges and Experiment Stations, was held at the Massachusetts Agricultural College in July. Its course included two main lines, (1) a progressive consideration of the fundamental factors in the growth of plants and animals, and (2) the economic and social factors entering into the development of profitable systems of agriculture and well organized rural communities, including distribution and marketing, finance, and the building of an adequate rural civilization. The courses emphasized the importance of working out rural life problems "from the soil to the soul." In connection with the sessions, numerous conferences on agricultural subjects were held.

Farm Women.—Several things have served to call attention lately to farm women and the justice of giving some public support to efforts for their welfare. One of these was the action of the Secretary of Agriculture in 1915 in soliciting suggestions from 55,000 farm women (*A. Y. B.*, 1915, p. 458), and another has been the organization on a national scale of extension work in home economics, to be conducted among women in the country. Some of the women's magazines and women's organizations have supported this work and given publicity to it. Far more is being done than ever before for the instruction and aid of women on the farms, not only in making their efforts more efficient and lightening their burdens, but in broadening their lives and stimulating better farm homes. Attention was drawn to this subject by the president of the National Education Association in his annual address, which was described as a discussion of "the dependence of the welfare of the rural home upon the education of the farm women and the conservation of their health and strength." The formation of a commission was urged to study the farm home and farm women.

Fertilizers.—As a result of the war in Europe the supply of potash for agricultural use has been cut off, and the available store has been practically exhausted. Farmers have been unable to purchase potash salts, and the amount supplied in mixed fertilizers has been reduced to one or two per cent., where formerly it was often five and even up to 10 per cent. This small amount was supplied from stocks in the hands of manufacturers at the outbreak of the war or assembled soon after. Farmers have made use of wood ashes and any other potash-carrying material at their disposal, and have been compelled in large measure to do without this fertilizing agent. In some cases hardship has resulted, but in many other sections where the practice had been to apply potash, the loss of it has not been seriously felt as yet. Indeed, experiments have shown that much land in the South, where potash has been extensively used, is not in need of that material, and the experience of necessity may have the effect of correcting the practice.

The discovery in central Utah of extensive deposits of alunite, a hydrous sulphate of potash and alumina, stimulated interest in processes for the extraction of potash from this relatively low-grade carrier. The manufacture has been undertaken on a commercial scale but such potash as has been produced has been sold for manufacturing purposes. The same is true of the product of several small factories on the Pacific Coast fitted up for recovering potash from kelp. With muriate of potash ranging at prices from $400 to $500 a ton, its use for fertilizer is prohibited. Experiments have been made in rendering the potash in feldspar available by fusing with calcium chloride, and field trials with the material have given quite satisfactory results. Congress provided an appropriation of $175,000 to enable the Bureau of Soils, Department of Agriculture, to establish and

equip a plant to determine the best method for obtaining potash on a commercial scale; and it also authorized the U. S. Geological Survey to conduct researches upon the geological conditions favorable to the presence of deposits of potash salts, with an appropriation of $40,000. (See also XXIV, *Agricultural Chemistry.*)

Recent experiments indicate that sulphur may have a quite important place in agriculture. In addition to its use in the treatment of a variety of plant diseases and against insects, evidence is accumulating that it may have use as a fertilizing material and a soil corrective. The subject has received considerable attention of late, and the progress of investigations on the relation of sulphur compounds to plant nutrition has been traced in previous issues of the YEAR BOOK (1912, p. 642; 1915, p. 623; see also XXIV, *Agricultural Chemistry*). Extensive studies at the Ohio Station have shown also an effect of sulphur on the solubility of raw rock phosphate. When sulphur and the rock phosphate were mixed with soil and left for a month, the solubility of the phosphate was increased, as a result of the oxidation of the sulphur to acid. J. G. Lipman and others, at the New Jersey Station, have found that elemental sulphur is rapidly oxidized in soils containing sulphophying bacteria, resulting in the accumulation of sulphuric acid. This acid readily reacts with basic substances, such as finely ground rock phosphate, rendering the latter available to crops. While this work is preliminary, the indications are that it may have large commercial and agricultural importance, enabling the extensive utilization of cheap insoluble phosphates for fertilizing purposes. The change in solubility is brought about by composting the materials for several months. C. B. Lipman, of the California Station, has found sulphuric acid of value in the reclamation of certain alkali soils, which has suggested the use of sulphur as a corrective, the sulphuric acid being produced from it by reaction in the soil.

Peanut Oil.—The growing of peanuts for oil has received considerable attention of late. There has been a large increase in the acreage of peanuts in the South, especially in the territory infested with the cotton boll weevil, and this has led to a search for a new outlet for a part of the crop. Peanut oil is one of the most important of the world's food oils, and is quite extensively imported into the United States. Up to 1915 very little commercial oil was produced in this country because peanuts have been disposed of in other channels at a price higher than the oil manufacturers could pay. The high price and scarcity of cottonseed have led several of the oil mills in the South to encourage farmers to grow the crop for oil. The machinery used in cottonseed-oil mills can be used for producing peanut oil with little adjustment and modification.

Spanish peanuts are found best suited to growing for this purpose, and yields of 40, 60, and up to 100 bus. an acre are not uncommon. It is necessary for the farmers to receive about 70 cents a bushel to warrant their growing the crop. A bushel of Spanish peanuts yields about 1⅛ to 1¼ gals. of oil. A valuable by-product is peanut meal, which is used for stock feeding. At present oil mills are offering a price for peanuts which justifies the farmers in growing them, but if cottonseed should become plentiful and cheap and the price of oil should drop, it would probably not pay farmers to grow the peanut crop extensively.

Necrology.—The list of deaths during the year includes an unusual number of men notable in agricultural work. Among these were Dr. E. W. Hilgard, formerly dean of agriculture in the University of California and director of the experiment station, and a world-wide authority on soils, who died on Jan. 8; Henry Wallace of Iowa, founder and editor of *Wallace's Farmer*, and long identified with public affairs, died Feb. 22; W. H. Bowker of Boston, widely known as a pioneer in the fertilizer industry and for many years a very active trustee of the Massachusetts Agricultural College, died Jan. 4; Dr. J. H. Kastle, director of the Kentucky Experiment Station and an eminent chemist, died Sept. 24; Prof. W. R. Lazenby, head of the department of forestry in Ohio State University and

one of the founders and first director of the Ohio Experiment Station, died Sept. 15; Dr. Thomas J. Burrill, of the University of Illinois, long identified with the work of the agricultural college and experiment station in that state, died April 14; Dr. A. J. Cook, economic entomologist and recently horticultural commissioner of California, died Sept. 29; and Prof. C. D. Smith, former director of the Michigan Experiment Station and lecturer on agricultural subjects, died Aug. 5.

Bibliography

Among the new books of the year the following may be mentioned:

Gardner, F. D.—*Successful Farming.* (Philadelphia, 1916.)—An intensive treatment covering the whole range of agriculture, compiled largely from the publications of the experiment stations, Department of Agriculture, and other agricultural writings.

Gillette, J. M.—*Constructive Rural Sociology.* (New York, 1916.)—A revised and enlarged edition of this work, published in 1913.

Harris, F. S. and Stewart, G.—*Principles of Agronomy.* (New York, 1915.)—A manual on crop production.

Huebner, G. G.—*Agricultural Commerce.* (New York and London, 1915.)—The organization of American commerce in agricultural commodities, markets and marketing, inspection, insurance, etc.

Phillips, E. F.—*Bee Keeping.* (New York, 1916.)—A large and fully illustrated treatise on this subject.

Vogt, Paul L.—*The Church and Country Life.* (New York, 1916.)—A report of a conference held by the Commission on Church and Country Life at Columbus, Ohio, December, 1915.

Voorhees, E. B.—*Fertilizers.* Revised by John H. Voorhees. (New York, 1916.)—A revised edition of this manual on the use of fertilizers.

Weld, L. D. H.—*The Marketing of Farm Products.* (New York, 1916.)—A treatise on the various phases of this subject, including storage, transportation, inspection and grading, coöperative marketing, etc.

Wilcox, E. V.—*Tropical Agriculture.* (New York and London, 1916.)—A treatise on the soils, climate, cultural methods, products, live stock, and commercial opportunities of the tropics.

A new journal, *Soil Science*, devoted to the problems in soil physics, soil chemistry and soil biology, began publication early in the year under the editorial management of Dr. J. G. Lipman, of the New Jersey Experiment Station.

DAIRYING

Milton D. Moore

Milk Production.—The Department of Agriculture estimates the production of milk in the United States during the year 1915 at 11,590,000,000 gals., or about 115 gals. per capita of population. At an average price of 20 cents per gallon the year's production of milk is valued at about $2,320,000,000 to producers.

The cost of milk production and the marketing of milk have received widespread attention during the year. Milk producers claim that the prices they are receiving for milk do not justify a continuance of operations, milk dealers feel that they are receiving only a fair share of the final price for the class of milk and service demanded by consumers, and consumers object to the constant increase in the price of milk. The situation has been most acute at Boston, Baltimore, Detroit, Washington, Chicago, and New York. At New York and Chicago there have been serious milk strikes. Municipal distribution is being strongly urged in various cities, notably Seattle, Jamestown, N. Y., and Washington.

A study of 174 typical farms in Delaware County, N. Y., for two years by the New York State Experiment Station at Cornell University, showed that the average cost of producing milk on these farms was 2.19 cents per pound, and the average price received for milk 1.7 cents per pound. The Department of Agriculture is continuing its investigations of the normal cost of milk production in different sections of the United States.

Dairy Conventions and Shows.—A conference of great importance to dairy interests of the United States was held in Washington, D. C., May 5-6, 1916, at which about 200 delegates representing 91 dairy, live-stock and farm organizations were present. Discussions at this convention dealt largely with the standardization of regulations governing the production, inspection and sale of milk and its products.

After a lapse of two years, due to the foot-and-mouth disease situation, the National Dairy Show was held in October at Springfield, Mass. This

meeting of the Dairy Show, with the score or more of conventions and meetings of interest to dairymen held in conjunction therewith, was the first to be held in the East. It surpassed all former meetings of the Dairy Show both in point of attendance and in the number of cattle shown. The 873 cattle on exhibition, consisting of 160 Ayrshires, 101 Brown Swiss, 198 Guernseys, 138 Holsteins, 267 Jerseys, and 9 Dexters, was said to be the largest number of pure-bred dairy cows ever brought together at any cattle show. The National Dairy Council carried on its active advertising campaign during the year, for educating the public as to the food value of dairy products.

Coöperative Associations.—The American Milking Shorthorn Breeders' Association has been founded with headquarters at St. Paul. Coöperative cow-testing associations organized and fostered by the Dairy Division of the Department of Agriculture had reached 346 in number on Oct. 1. These associations had 150,677 cows on test in 1916. It is estimated, however, that 18,000,000 of the 22,000,000 milch cows in the United States are in herds of less than 12 cows each, and, hence, on account of expense, are not within the scope of cow-testing associations. For these small herds the Dairy Division is organizing bull associations, and on Oct. 1 there were 32 associations of dairymen for the interchange of pure-bred bulls.

Pasteurization.—In investigations at Cheddar-cheese factories and skimming stations, the New York Geneva Experiment Station found that the use of direct steam and the combination of direct steam and jetting are the best methods of pasteurizing whey. With skim milk best results were secured when the milk was returned to the patrons' cans at a temperature high enough to remain above 145° F. for 30 minutes. The Dairy Experiment Division has found that the average cost of pasteurizing cream is about 45 cents per 100 gals., or 0.15 cent per pound of butter. Work at the Indiana Station has shown that pasteurizing milk at low temperatures hastens the rising of cream and deepens the cream line.

Cost of Raising Dairy Heifers.—The Ohio Station has found the average cost of raising Jersey and Holstein heifers from birth to calving at 26.5 months to be $91.39. The Massachusetts Station places the cost of raising the average dairy heifer to two years at $75 to $85. The Department of Agriculture estimates the age of maximum valuation of both grade and pure-bred cows of all dairy breeds at six years.

Nutrition Investigations.—The Missouri Station has demonstrated that it is possible to influence the rate of growth, size when mature, and type, to some extent, of cows by the liberality of the ration during growth and the age at first calving. The amount of feeding nutrients supplied during growth does not appreciably affect the milking functions of the cow when mature. Investigations at the Wisconsin Station show that proteins of various sources are of widely different worth for milk production and growth, and indicate the need of more efficient and economical compounding of rations. The Missouri Station has found that overfeeding cows has a tendency to cause the production of normal milk and butter and that underfeeding may at times cause great abnormalities in the composition of milk and milk fat.

Milk Hygiene.—Studies at the Illinois Station have shown that the barn and the cow are relatively unimportant sources of bacteria in dairy products, as compared with dairy utensils and the temperature maintained during transportation. The New York Geneva Station found that in commercial stables, under ordinary conditions, the number of bacteria added to milk due to the condition of the stable air is too few to be detected by known methods of analyses. The Kentucky Station found that dust in the barn and the failure to sterilize utensils are two of the chief reasons for high bacterial counts. The Dairy Division of the U. S. Department of Agriculture has described a simple and inexpensive, yet efficient, steam sterilizer which can be used on the ordinary kitchen stove.

Cheese Making in Mountain Districts.—Important results are being obtained by the Dairy Division in the

establishment of small coöperative cheese factories in valleys remote from railroads in the Rocky Mountains and in the Appalachian Mountains of the southeastern states. On account of the cheapness of labor, excellent natural advantages for live-stock farming, and the abundance of cold water, these mountain districts afford almost ideal conditions for cheese making.

Dairy Records.—Among the high production records of the year are the following: The Holstein cow Dutchess Skylark Ormsby recently completed a year's record of 27,761 lb. of milk and 1,205 lb. of fat. The Ayrshire cow Lily of Willomoor has completed her fifth consecutive year's record, the average annual production being 16,991 lb. of milk, and 672.47 lb. of fat. The Jersey cow Sophie 19th of Hood Farm has completed her sixth lactation and sixth yearly test, which resulted in an average annual production of 12,653.5 lb. of milk and 738.9 lb. of fat.

The danger of placing too much emphasis on the average fat content resulting from a 7-day test was brought out by tests recently conducted at the Kentucky Station. One cow for one week gave milk that showed a test of 4.18 per cent. fat, but for the year previous her average test was 3.42 per cent. fat. Another cow gave milk which tested 4.04 per cent. for a period of seven days, but for a year the average fat content of her milk was 3.19 per cent.

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Larson, C. W.—*Milk Production Cost Accounts.* (New York, 1916.)—A method of cost computation wherein feed costs are pre-calculated.

Ross, H. E.—*Laboratory Guide in Market Milk.* (Ithaca, N. Y., 1915.)—A book for students in dairy laboratories.

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LIVE STOCK

G. M. Rommel

Meat Production.—The European War has had a profound effect on the live-stock trade of the United States, particularly that in meat animals and meat products. Five years ago the United States had practically ceased to export dressed beef. During the fiscal year ended June 30, 1914, less than 7,000,000 lb. of fresh beef were exported. In the fiscal year 1915 over 170,000,000 lb. were exported, and in the fiscal year ended June 30, 1916, over 231,000,000 lb. Corresponding increases are noted in practically every item of importance listed in export returns. The total value of meat products exported during the three fiscal years mentioned was as follows: 1914, $143,261,846; 1915, $205,785,468; 1916, $266,795,608.

Beef-cattle supplies respond somewhat slowly to increased demand, and the number of beef-cattle available has not yet brought relief from the scarcity of recent years, which scarcity has been greatly aggravated by the exports to Europe. The number of cattle slaughtered at plants under Federal inspection during the fiscal year 1916 shows a considerable increase over the preceding year, 7,404,288 cattle having been slaughtered, but still considerably less than the average slaughter from 1907 to 1913. The slaughtering of swine, however, during the last fiscal year was the greatest in the 10 years of Federal inspection, 40,982,799 hogs having been slaughtered, an increase of over 4,000,000 above the preceding fiscal year. Sheep, on the other hand, show a decrease of nearly 1,000,000 head, the sheep industry having responded rapidly to the high prices of lambs and wool, farmers and ranchmen holding stock which can be used for breeding purposes. The large increase in the number of hogs slaughtered affects the returns for all animals slaughtered, which is 62,101,391, an increase of almost 12,000,000 head over the year 1907, the first year of operation of the Federal meat-inspection law.

Prices have, as a rule, responded to the increased demand. During September, 1916, all meat animals were

selling on the Chicago market at around $11 per 100 lb. on the hoof, and during that month $11.60 was paid for hogs, the highest price known on that market for these animals. Prospects for high prices of grain seem to insure a continuation of high prices for meat animals during the immediate future.

The prices of breeding stock have increased rapidly during the year of 1916. Sales of registered pure-bred animals have reached averages greater than any which have been obtained in the United States in a generation, and for some breeds the highest on record. Producers of cattle, sheep and hogs are enjoying a high degree of prosperity, although feeders, who are more or less speculators, do not face so promising a situation as do the breeders, on account of the high prices which must be paid for feeding stock, and the high prices of grain.

The Horse Trade.—The European War has caused the largest exports on record of horses from the United States. This trade began in September, 1914; during the calendar year 1915 it averaged between 22,000 and 39,000 horses per month. During the calendar year 1916 the export of horses has not been so great, figures running from 16,000 to 24,000 per month. Considerable numbers of mules also have been exported, running over 13,000 in the month of May, 1915, and averaging close to 10,000 per month for the year 1916. To the close of August, 1916, 640,788 horses had been exported to Europe and Canada, and 215,302 mules, practically all of which were for military purposes in Europe. This represents less than three per cent. of the total horse and mule stock of the country. The estimated annual colt crop is 1,500,000, and it is not surprising that this demand has not greatly affected the price of horses on the whole. The quality of horses which are being taken does not average high, and the European demand has enabled farmers to dispose of many ordinary animals which might otherwise have been unmarketable.

Sheep and Wool.—The sheep industry has made a quick recovery from the depression which followed the placing of wool on the duty free list, Dec. 1, 1913. For some time previous, there had been a tendency on the part of Western producers to discontinue sheep raising. The reports of Federal inspections show a constant increase in the number of sheep slaughtered from the year 1907 to the year 1914, almost 15,000,000 sheep being slaughtered in that year. Since that time, however, slaughtering has shown a decrease, less than 12,000,000 head being slaughtered in the fiscal year 1916. At present, a smaller proportion of lamb and mutton is going into the export trade than is the case with beef. Only 5,500,000 lb. of mutton, with a value of less than one million dollars, was exported during the fiscal year 1916. The people of the United States are using mutton more and more in their diet, small families especially finding lamb and mutton cuts very convenient to use, although retail prices may be high.

Prices of wool have been maintained at a high figure, and a world shortage was accentuated by the demands of the European War. Normally, the United States imports from two-fifths to slightly over one-half of the wool needed in her mills, but since the European War began manufacture has increased greatly. In the fiscal year 1914, over 245,000,000 lb. of wool of all grades was imported. This amount increased to over 302,000,000 lb. in 1915, and more than 525,000,000 lb. in 1916. The number of sheep in the country at present is probably not more than it was 30 years ago, but the high prices of lambs and wool have excited interest among farmers and there is reason to believe that the future will see an increase in the number of sheep kept on farms. The range has reached its capacity in sheep production and any increase in the sheep production in the country must come from an increase in farm sheep raising.

The movement which started in 1913 to improve the conditions under which wool is handled on the range has not abated, although no appreciable effect has been made on marketing customs. Two modern shearing sheds were erected in 1915 and five in 1916. In these sheds wool is carefully handled, classed with system, and baled in packages of uniform charac-

ter. The old custom on the range of selling wool on the sheep's back is threatened by the innovation. In some farming sections considerable success has met efforts of growers to pool their clips and sell coöperatively.

Extension of the Industry.—Official figures of the Department of Agriculture indicate that the live-stock industry is, except in the case of sheep and horses, extending with considerable rapidity (see *Statistics of Agriculture, infra*). This is especially apparent in the South and on the irrigated and dry-land farms of the West. There was no increase in the number of horses on Jan. 1, 1916, and only a slight increase in mules. Dairy cattle showed an increase of 3.4 per cent., beef cattle 6.4 per cent., and swine 5.3 per cent. States showing an increase of five per cent. or more of dairy cows were with one or two exceptions those where dry-land or irrigation farming is a prominent feature of agriculture. Increases of five per cent. or more in "other" (beef) cattle are more general, the South, the corn belt, the range, and even eastern states coming under this category. Thirteen states show an increase of 10 per cent. or more in numbers of swine. Of these five are southern states and five are far-western states.

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VETERINARY MEDICINE

WILLIAM A. HOOKER

Societies and Institutions.—The fifty-second annual meeting of the American Veterinary Medical Association was held at Detroit on Aug. 21-25, with an attendance of nearly one thousand. Recommendations were adopted in regard to obtaining uniform entrance requirements by the veterinary colleges on the accredited list of the Association, and the report of the committee recommending a curriculum of 28 months extending over four collegiate years, amended to commence with the session of 1916-17, was accepted. The officers elected for the following year are: president, Dr. C. E. Cotton of Minneapolis; secretary, Dr. L. A. Merillat of Chicago; and treasurer, Dr. F. H. Schneider of Philadelphia.

The laboratory for the new department of animal pathology of the Rockefeller Institute of Medical Research, located on a tract of 400 acres at Princeton, N. J., was to be completed before the close of the year, about $1,000,000 being required for its construction and equipment. The research work was carried on during the year at Princeton University under the direction of Dr. Theobald Smith, with Dr. C. TenBroeck as associate in the department of animal pathology and Dr. W. Werner Marchand as assistant.

Federal Investigations.—Among the more important appropriations made by Congress for work against diseases of domestic animals for the fiscal year ending June 30, 1917, were $632,400 for the eradication of the Texas-fever tick and for promoting live-stock production and dairying in areas freed of ticks; $50,000 to develop means for controlling contagious abortion; $75,000 for treatment and eradication of dourine; $360,000 for hog-cholera work, including the inspection of hog-cholera serum plants and the enforcement of the Virus-Serum-Toxin Act; and an increase of $5,000 for the purpose of extending investigations of plants poisonous to live stock.

Foot-and-Mouth Disease.—The year saw the close of the successful fight against foot-and-mouth disease (*A. Y. B.*, 1914, p. 451; 1915, p. 464), which during its course gained temporary footing in 269 different counties in 22 states and the District of Columbia. An order issued by the Secretary of Agriculture on March 31 removed the quarantine on a small territory in Christian County, Ill., and therewith all quarantines and restrictions against shipment and movement of

live stock established on account of this disease. (See also XXVII, *Public Health.*)

Hog Cholera.—Inquiries made throughout the country have led to the conclusion that hog cholera is the source of 48.9 per cent. of all losses of swine, including those due to disease, parasites and predatory animals. It was estimated that there is a yearly loss of swine in this country due to hog cholera to the value of $32,502,000. Investigations by Dorset and Henley have led to the discovery of a new method of preparing anti-hog-cholera serum which makes possible the economical production of a clear sterilized product. This method consists in the addition of a small amount of an extract from ordinary white navy beans to the defibrinated hog-cholera immune blood, which has been the form of serum used in the past, and results in a serum which can be heated to a point that will absolutely kill any germs of foot-and-mouth disease and hence is safe, even if taken from an infected hog. Investigations at the Kentucky Experiment Station by Healy and Gott indicate that the virus of hog cholera on incubation with hyper immune blood for 48 hours at 37° C. is so modified that when injected it will no longer render normal hogs sick but will protect them when later they are exposed to hog cholera. The virus on incubation with normal rabbit serum for 48 hours at 37° was modified to the extent that one of three animals was protected against cholera. The use of hog-cholera globulin on 3,000 hogs in Kentucky by Graham has shown it to possess immunizing properties equal to the whole unrefined hog-cholera serum and offers the advantage of being sterile and reducing the labor of administration.

Texas Fever and Cattle Tick Eradication.—Noteworthy progress has been made in the work of eradicating the cattle tick. A total area of 9,739 sq. miles in six states was released from quarantine on March 10, and approximately 9,493 sq. miles in six states on Sept. 15. Thus 40 per cent. of the southern territory put under quarantine in 1906 on account of the Texas-fever tick was released by Sept. 15. In all, 294,014 sq. miles have been freed of this pest and 434,529 sq. miles still remain under quarantine. Of special interest is the fact that the states of California, Kentucky, Missouri and Tennessee have completely eradicated the tick from within their borders and are released from quarantine. With the release from quarantine during the year of two counties and a part of a third in Florida, there is no tick-infested state in which some counties have not been made free of the pest.

White Diarrhea in Chicks.—In the first year's campaign against bacillary white diarrhea in Connecticut, 14,617 individual fowls and 107 flocks were tested by the microscopic agglutination test and 9.85 per cent. of the fowls found to be infected. The greatest value of the agglutination test is in its determination of infected and uninfected flocks, since only uninfected flocks should be used as future breeders.

Trichina.—Investigations by Ransom show that trichinae vary in their resistance to cold and some individuals survive refrigeration longer and at lower temperatures than others. He concludes that in the practical application of refrigeration as a means of destroying the vitality of trichina, meat should be held at a temperature not higher than 5° F. for not less than 20 days, which period allows a probable margin of safety of nearly ten days. It remains to be determined whether temperatures higher than 5° may safely be employed by lengthening the period of refrigeration.

Contagious Abortion.—The enormous loss caused to live-stock owners by contagious abortion, which is second only in importance to that of tuberculosis and is estimated at $20,000,000 annually, has led Congress to appropriate $50,000 for the development of means of controlling it. Reports from many sections indicate that the disease is spreading rapidly to all parts of the country. A hyper-immune serum prepared by Good and Smith at the Kentucky Experiment Station protected rabbits from the lethal dose of the organism of infectious abortion in mares and in one instance from five times the lethal dose. The serum did not protect a mare from artificial infection, but it is sug-

gested that the serum will prove of value in a stud where the infection is known to exist. Other investigations at this station led to the discovery that infectious abortion, which occasionally occurs in sows, may be produced by the *Bacillus abortus* of Bang.

Blackleg or Symptomatic Anthrax.—The blackleg serum, prepared in Kansas, which is a sterile filtered serum of animals highly immunized against blackleg by *Bacillus chauveaui*, has been found not only to protect animals against the disease but often to check it if given in its early stages. This serum has been used on over 25,000 head of calves with practically no loss. Since it will protect animals for only ten days to two weeks, for a long period of immunity it must be followed in three days with a very strong dose of vaccine. When vaccinated in this way immunity lasts for more than 12 months.

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DISEASES OF PLANTS

Walter H. Evans

Legislation and Regulation.—During the session of Congress which adjourned on Sept. 8, appropriations in excess of $268,000 were made for investigations by the Department of Agriculture of plant diseases, and $250,000, together with the balance from a previous appropriation of $300,000, was made available for the eradication of citrus canker in the Gulf states, the work being done in coöperation with state organizations. Legislation has been enacted in some of the states to aid in controlling this serious trouble. Domestic and foreign quarantines on account of plant diseases are in effect in the United States as follows: the introduction of sugar cane from Porto Rico and Hawaii and all foreign countries; Irish potatoes from Canada, Newfoundland, and nearly all of Europe; all five-leaved pines and all varieties of currants and gooseberries from Europe and Asia; citrus nursery stock from all countries; and maize or Indian corn from India, Java, and Oceania. The use of the mails for the shipment of plants from certain countries has been prohibited or greatly restricted. Other quarantines are in effect on account of insect pests.

Nonparasitic Diseases.—Allard has continued his investigations of the mosaic disease of tobacco, which other investigators claim is not due to a specific organism but which Allard believes is caused by an organism so minute as to escape detection. He has recently shown that the disease may be transferred from tobacco to petunias and tomatoes, but it does

not appear to be transmitted by their seed. A comprehensive report has been issued by the U. S. Bureau of Mines, giving the results of an investigation by the Selby commission on the injury to plants due to smelter fumes. Several contributions to this topic have appeared in various European countries. A disease of cucumbers known as mosaic, or white pickle, that has not been associated with any organism, has made its appearance in several localities in the United States. The black heart of potatoes, which seems to be connected with temperature relations in storage, is receiving the attention of pathologists. A disease of greenhouse tomatoes has been described from Ontario which seems to be due to some chemical or physical soil condition. This trouble had previously been reported from different localities in the United States.

Cereal Diseases.—Barrus has given the results of a study of the pathological morphology of the stinking smut of wheat, tracing the development of the fungus through many stages of growth of the host plant. The stripe rust of wheat (*Puccinia glumarum*), first reported in this country in 1915 (*A. Y. B.*, 1915, p. 466), is said to have been severe in its attack in Oregon and Idaho, 70 to 90 per cent. of infections being recorded. A leaf disease of rice resembling smut has appeared in Louisiana and Texas, and a downy mildew of rice, due to *Sclerospora macrospora*, is reported in Italy. A bacterial disease of barley has been described by Jones and others in Wisconsin; it is known to occur also in other states. O'Gara has reported on a bacterial disease of western wheat grass in Utah that is attributed to *Aplanobacter agropyri*. A leaf smut of timothy, due to *Ustilago striæformis*, is said to occur in the states of Indiana and New York.

Forest-Tree Diseases.—Numerous studies of forest-tree fungi and diseases have been reported in this country and abroad. The white-pine blister rust is commanding attention at present on account of its rapid spread. At least 12 distinct outbreaks in the United States were reported in 1915, and it is definitely known to occur in New Hampshire, Vermont, Massachusetts, Connecticut, New York, and Pennsylvania. It has also appeared in Ontario and is attracting attention in Europe, from whence it was brought to this country. A serious disease of the western yellow pine, due to *Hypoderma deformans*, has been described by Weir. A leaf disease of horse chestnuts, caused by *Guignardia æsculi*, is reported by Stewart to defoliate the trees. The bamboo smut is said to occur on plantations of bamboo in Florida and California, it having apparently been introduced from Japan. The chestnut blight is continuing its destructive spread in the eastern states. A blister rust and a needle rust of spruce have been reported in Scotland where they defoliate the trees in case of severe attack. The black canker of chestnut trees in Italy has been found due to a species of *Coryneum*. A survey of the important diseases of Para rubber trees in Java has shown at least a dozen species of fungi concerned in various types of injury to these trees.

Diseases of Fruits and Fruit Trees.—Some unusual manifestations of fire blight (*Bacillus amylovorus*) are reported from the Pacific Northwest, where pear, apple, prune, peach, and cherry trees, leaves, and fruit are attacked. In Pennsylvania, a collar blight of apple trees due to the same cause is reported as serious. The organism has been found capable of retaining its vitality from 10 to 27 days in branches cut from trees. A serious apple-tree canker, due to *Plenodomus*, has been described in Michigan. In New York, tree crickets have been found carriers of the fungus *Coniothyrium fuckelii*, the cause of a kind of canker of apple trees. In West Virginia, and Virginia, cutting out cedar trees, which carry one stage of apple-rust fungus, has been found a practicable means of control. Ewart claims poisons sprayed on apple trees are responsible for apple bitter pit in Australia, but Crabill and Thomas have shown where spraying is properly done no fruit spotting is produced. A disease of almond trees new to America is reported in California. It is thought to be identical with a disease in Italy due to

Glœosporium amygdalinum. The cottony rot of lemons in packing houses in California has been found to be caused by *Sclerotinia libertiana.* A blossom blight and fruit rot of prunes, due to a related species, can be controlled by proper spraying. Sackett found *Sphærella rubina* quite destructive to red raspberries in Colorado. Stevens and Peterson recently described *Sphæronœmella fragariæ* and *Patellina fragariæ* as causing serious losses in strawberries while in shipment. The mildews have been quite destructive in French vineyards, where spraying has not been properly done, due to war conditions. The same fungi are reported to have been destructive in vineyards in Brazil in 1915.

Diseases of Vegetables, etc.—Haskell recently described a disease of potatoes due to *Fusarium eumartii.* In Idaho, *Fusarium radicicola* has caused a field rot of the same crop. A bacterial rot of stored potatoes is reported in India. A number of diseases of tomatoes have recently been destructive in greenhouse culture. Peglion described a bacterial disease of tomatoes in Italy. A bacterial disease of cucumbers due to *Bacillus burgeri* has been described in Russia. It is considered identical with the disease reported in Florida by Burger in 1914. Rand has shown that the bacterial wilt of cucumbers is transmitted by beetles, the organism being carried over winter by one species. Carpenter found a disease of lettuce in the lower Rio Grande Valley was due in part to alkali in the soil and irrigation water. A disease known as neck rot of onions, due to *Sclerotium cepivorum,* caused considerable losses in Ohio. Sackett described *Pseudomonas pisi,* the cause of a bacterial disease of field and garden peas in Colorado. A stem-end rot of watermelons that causes decay during shipment has been found due to a species of *Diplodia.* According to Rolfs, the angular leaf spot of cotton, a disease of wide distribution, is caused by *Bacterium malvacearum.* Diseases due to nematodes are receiving much attention by plant pathologists, and several such diseases not hitherto reported have been described during the year.

Control of Plant Diseases, Fungicides, etc.—German publications on plant diseases are largely taken up with diseases of cereals, potatoes, sugar beets, etc., and means for their control. In Florida and other southern states, an active campaign is in progress for the eradication of citrus canker, the trees being sprayed with heavy oil and burned. Johnson reports warm solutions of formalin very efficient for the control of smuts of cereals. Hot water applied as a spray to grapevines is said to be a successful treatment for mildews. The vines when sprayed with hot water withstand temperatures of 70° C. without injury. Lime-sulphur as a substitute for Bordeaux mixture is becoming more extensively employed as a summer spray as it does not cause so much russeting of fruits. The use of dry fungicides is coming into favor. Finely ground sulphur and dry lead arsenate are said to give excellent results in the control of diseases of nursery stock. Dry carbonate of copper thoroughly mixed with seed wheat is said to prevent smut. As a result of 13 years' work in spraying potatoes with Bordeaux mixture, net gains of $15 per acre were obtained by the Connecticut State Experiment Station.

ECONOMIC ENTOMOLOGY

William A. Hooker

Necrology and Changes in Personnel.—During the year Prof. J. G. Sanders, former state entomologist of Wisconsin, resigned to become economic zoölogist for the state of Pennsylvania, the vacancy in Wisconsin being filled by Dr. E. D. Ball, formerly director and entomologist of the Utah Experiment Station. Nathan Banks, for more than 20 years an assistant entomologist in the Bureau of Entomology of the U. S. Department of Agriculture and well known for his systematic work, resigned to become curator of the insect division of the Museum of Comparative Zoölogy at Harvard University.

The year witnessed the passing of several of the older entomologists. Dr. Albert J. Cook, formerly professor of zoölogy in the Michigan Agricultural College and entomologist at

the Experiment Station, and since 1911 state commissioner of horticulture for California, died on Sept. 29 at the age of 74; he was probably the first experimenter to recommend the use of a mixture of kerosene oil and soap water as an insecticide. Prof. Francis M. Webster, entomologist at the Ohio Agricultural Experiment Station from 1891 to 1902 and since July, 1904, chief of cereal- and forage-crop insects investigations of the Federal Bureau of Entomology, died at Columbus, Ohio, on Jan. 3, at the age of 66. Theodore Pergande, assistant to the late Dr. C. V. Riley when the latter was state entomologist of Missouri, and since June, 1878, a scientific assistant in the Bureau of Entomology of the U. S. Department of Agriculture, died on March 23 at the age of 76; he was a keen observer of the structure and habits of insects and well known for his work on the Aphididæ.

Alfalfa Weevil.—The alfalfa weevil, an important enemy of alfalfa introduced from Europe and dicovered in the Salt Lake Valley, Utah, in 1904 or 1905, continues to spread, particularly rapid dissemination having taken place during 1916. During the 12 years since it was introduced into this country it has been confined to the limits of the Great Basin of the West, but during 1916 it was found at four points in Idaho within the Snake River drainage system and at Duchesne, Utah, within the Colorado River system. Secondary colonies of European parasites transplanted from the site of the original importation of 1912 (*A. Y. B.*, 1912, p. 466) have survived, spread continuously, and killed as high as 25 per cent. of the weevil larvæ.

Argentine Ant.—This important enemy of the household, field crops, etc., first discovered in this country at New Orleans in 1891, continues to spread. It is now known to occur in nine southern states, extending over a total area of considerably more than 1,000 sq. miles. A report of the present status of knowledge of the pest by E. R. Barber of the Federal Bureau of Entomology, issued during the year, includes an improved formula of a poisoned sirup, said to be superior to any yet tested for the eradication of the pest on account of its stability at high temperatures, freedom from crystallization, and continued attractiveness.

Gipsy Moth.—During the year the gipsy moth was found in 15 towns in four New England states where it had not been known to exist previously, and was apparently exterminated in 11 towns in four New England states. Former sites of colonies in Ohio, New Jersey, and New York where eradication work had been carried on disclosed an infestation at only one place.

Pink Bollworm.—The occurrence of the pink bollworm in the Laguna District of Coahuila, Mexico, within 200 miles of the Texas border, was discovered in November, and an absolute embargo was placed upon the importation of Mexican cotton seed, cottonseed hulls and seed cotton, and it is required that lint cotton be imported through certain northern ports remote from cotton fields. This pest, which constitutes one of the greatest menaces that has come to the American cotton industry in its history, had not previously been known to occur on the American continent although prevalent in practically all of the other cotton-producing regions of the world, in all of which it has caused widespread destruction.

Cotton Boll Weevil.—The cotton boll weevil continued to spread, reaching the northern limits of cotton culture in Oklahoma and western Arkansas, the Atlantic coast below Savannah in southeastern Georgia, and within about 50 miles of the southern border of South Carolina. It was estimated by the president of the National Ginners' Association that the year's loss caused by this pest reached as high as two million bales of cotton, valued at $20,000,000.

Mediterranean Fruit Fly.—Investigations of this important pest carried on in Hawaii were reported upon by Back and Pemberton. Cold-storage experiments have shown that no egg or larva survives refrigeration at 40 to 45° F. for seven weeks, at 33 to 40° for three weeks, or at 32 to 33° for two weeks; and that pupæ do not survive exposure to a temperature of 32° for 10 days. This knowledge may lead to the modification of existing

quarantines and encourage the refrigeration of fruit subject to fruit-fly attack. Studies of the banana as a host fruit lead these authors to conclude that bunches of any variety now grown in the Hawaiian Islands, when properly inspected for the removal of prematurely ripe, cracked or partially decayed fruits and, properly wrapped and shipped, offer no danger as carriers of the Mediterranean fruit fly. At least four important introduced parasites have established themselves, and are already promising much as a factor in the control of the pest.

Mosquitoes and Malaria.—Considerable advance was made during the year in the knowledge of the transmission of malaria by mosquitoes. Investigations by King and by Mitzmain reported during the year have shown that in addition to *Anopheles quadrimaculatus, A. punctipennis,* another common species, is an efficient host of the organisms of tertian (*Plasmodium vivax*) and estivo-autumnal (*P. falciparum*) malaria, and *A. crucians* of the latter. Experiments with *A. punctipennis* and tertian malaria have shown that a single mosquito is sufficient to transmit the parasite to four individuals.

Typhoid or House Fly.—The results of three seasons' work by the Federal Department of Agriculture led to the conclusion that borax used at the rate of two-thirds of a pound to 10 gals. of water per eight bushels of manure is the least expensive and most effective larvicide. Powdered hellebore at the rate of one-half pound to ten gallons of water is also effective. Investigations by Gutberlet have shown the house fly to be the host of the intermediate or cysticercoid stage of a chicken tapeworm, *Choanotænia infundibuliformis.*

Insect Control.—Experiments by Moore of the Minnesota Experiment Station show that animals may be successfully fumigated with nitrobenzene, the ectoparasites being killed without injury to the host. Ross reports the extermination of the bedbug from a two-story frame house through raising the temperature to 140° F. Exposure to Roentgen rays under certain conditions was found by Runner to be effective in sterilizing the eggs of the cigarette beetle. It was found that this beetle may be controlled economically through the storage of manufactured tobacco at low temperature. Control work with the strawberry weevil by Headlee has shown that a mixture of one part arsenate of lead to five parts of sulphur maintained as a dust coating throughout the two weeks when the strawberry is subjected to serious attack will afford almost perfect protection. In cotton boll-weevil control work in the Mississippi Delta, Coad found that five pickings of the squares at seven-day intervals and seven weevil pickings with the hoop-and-bag gave an increase of 23 per cent. over the check, although the margin of profit was doubtful.

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AGRICULTURAL LEGISLATION

H. L. Knight

Federal Legislation.—An unusual amount of legislation pertaining to agriculture was enacted in the opening session of the Sixty-fourth Congress, and much of it was of considerable importance.

Agricultural Credit.—The most noteworthy measure was the Federal

Farm Loan Act establishing a distinctive Federal system of rural credit based upon farm real estate, which is described elsewhere (see *Agriculture, supra*). The powers of national banks to make loans on farm lands located within the same Federal reserve district were broadened in some cases by an amendment to the Federal Reserve Act of 1913, authorizing loans on farm lands outside the district but situated within 100 miles of the bank.

United States Grain Standards Act.—This measure, enacted Aug. 11, was embodied in the Agricultural Appropriation Act (see also *Agriculture, supra*). It authorizes the Secretary of Agriculture to investigate the handling and grading of grain, establish official standards, license grain inspectors, and otherwise administer its provisions. After standards for a grain have been promulgated, all shipments by grade in interstate or foreign commerce must either be inspected by a licensed inspector at the point of shipment, during transit, or at the point of delivery, or, if there are no inspection facilities available, may be marketed uninspected but subject to the right of either party to the transaction to refer any dispute as to the grade to the Secretary of Agriculture. An appeal may also be taken as to the true grade of grain which has been inspected. The findings of the Secretary in cases of dispute and appeals are made *prima facie* evidence in court proceedings. The power of certifying as to an official grade on shipments subject to Federal supervision is restricted to inspectors holding Federal licenses. These licenses are to be issued to persons authorized to inspect and grade grain under state laws, or may be issued to any other competent and disinterested person, and may be suspended or revoked for cause. A complete system of records and reports is required of inspectors, and penalties are provided for false grading, interference with officials, and other violations of the Act.

Standard Baskets and Lime Barrels.—Standards for the so-called "Climax baskets" for grapes and other fruits and vegetables, and for other types of baskets and containers used for small fruits, berries, and vegetables in interstate commerce are provided in a law approved on Aug. 31 which becomes effective on Nov. 1, 1917. Standards of two, four, and twelve quarts dry measure are provided for the Climax or "grape baskets," while other containers are restricted in size to one-half pint, one pint, one quart, and multiples of one quart dry measure. Penalties are prescribed for shipments in interstate commerce which do not conform with these requirements. The U. S. Department of Agriculture is charged with the administration of the law.

All lime handled in interstate commerce in barrels must be packed in so-called "large barrels" of 280 lb. net, "small barrels" of 180 lb. net, or some fractional part of the small barrel. In any case the net weight must be indicated. Penalties are provided for violations of the Act, beginning Jan. 1, 1917.

Seed Inspection Act Amended.—The Seed Inspection Act of 1912 (*A. Y. B.*, 1912, p. 467) was amended by extending its provisions to include vetch and rye grass, and by prohibiting the importation of seed of Kentucky and Canada blue grass unless containing at least 50 per cent. of live pure seed, and the importation of all other kinds of seed subject to the act unless containing at least 65 per cent. of live pure seed.

Other Legislation.—The National Defense Act (see XII, *The Army*) authorized the President to determine the best means for the production of nitrates and other materials for munitions of war and useful in the manufacture of fertilizers, and to construct and operate one or more plants for the manufacture and sale of these products. This enterprise carries an appropriation of $20,000,000. (See also XXIV, *Agricultural Chemistry.*)

The Federal Aid Road Act (see X, *Highways*), which provides large appropriations for coöperation with the States in the construction of rural post roads, the United States Cotton Futures Act (see *Agriculture, supra;* and XIII, *The Conduct of Business*), which reënacts in slightly modified form the Act of 1913 (*A. Y. B.*, 1913, p. 346; 1915, p. 346), and the United States Warehouse Act (see *Agricul-*

ture, supra), which provides a voluntary system for the licensing of bonded warehouses and the establishment of a standardized receipt for cotton, grain, wool, tobacco, and flaxseed, are described elsewhere in this issue of the YEAR BOOK.

State Legislation.—Although the legislatures of comparatively few states were in session in 1916, a number of important laws were enacted, especially along economic lines.

Agricultural Credit and Coöperation.—In South Carolina a state Rural Credits Commission was authorized to consider the need of a state system. Bonds of the New York State land bank were made legal security. The formation of agricultural or dairy coöperative associations was authorized in Rhode Island under prescribed regulations.

Marketing Farm Products.—The principal legislation of the year on this subject was in Virginia. A division of markets was established in the Department of Agriculture and Immigration to study the cost of food production, assist in the organization of coöperative societies, gather and disseminate information on marketing questions, investigate complaints in relation to the transportation of agricultural products, etc. The licensing and bonding of commission dealers in farm produce was required, the licenses being subject to revocation by the Department of Agriculture for cause.

In Mississippi municipalities were prohibited from preventing sales of meats and other foodstuffs by the producer to the consumer in any quantities. This law thus nullifies local regulations restricting producers to wholesale dealings under some conditions.

Providing Agricultural Lime.—The state commissioner of agriculture, commerce, and industries of South Carolina was authorized to attempt to obtain from manufacturers crushed marl and ground limestone for sale to farmers at as near the cost of handling as possible. In case of inability to obtain supplies he is to recommend to the legislature a plan for mining these products by the state with convict labor. A state Agricultural Lime Board was established to operate a plant in southern Maryland to convert oyster shells into agricultural lime and sell the product to farmers at cost.

Inspection and Other Regulatory Laws.—The fertilizer laws of South Carolina were amended by lowering the requirements as to potash. Maryland and Virginia amended their lime-inspection laws.

New Jersey and Virginia amended their feeding-stuffs laws, the latter by requiring labeling to show the presence of oat hulls, peanut hulls or shells, cottonseed hulls, and flax by-products or screenings. New seed laws were enacted in Kentucky, Maryland, New Jersey, and Virginia. Additional provisions as to the inspection of nursery stock were adopted in Maryland and Massachusetts, and apiary inspection was provided in Maryland.

What is considered the most rigid milk law thus far adopted was enacted in California, the tuberculin testing of dairy cattle or the pasteurization of their milk when sold in the state, either as such or in dairy products other than cheese, being made obligatory. New Jersey required the testing of glassware used in determining the fat content of milk, and Virginia regulated the sale of oleomargarine.

The number of states requiring stallion registration was increased to 21 by the addition of New York. State compensation for animals condemned for contagious diseases was provided in Mississippi. The Massachusetts apple-grading and packing law was amended and a similar law adopted in Maryland.

Agricultural Education.—A special commission was appointed in Massachusetts to investigate agricultural education as related to the Massachusetts Agricultural College and the development of the agricultural resources of the state. The Maryland Agricultural College at College Park was reincorporated as a distinctively state institution under the name of the Maryland State College of Agriculture.

A uniform course of study was prescribed for the agricultural high schools of Mississippi. South Carolina adopted the policy of state aid

to promote the teaching of agriculture in the public schools. A referendum was arranged in Massachusetts as to authorizing cities and towns to establish schools under the supervision of the state Board of Education for teaching agriculture and horticulture to families and individuals in day, part-time, or evening classes.

Miscellaneous.—A state Department of Agriculture was established in New Jersey to include a secretary, an assistant secretary, a state Board of Agriculture, a Bureau of Animal Industry, a Bureau of Lands, Crops and Markets, and a Bureau of Statistics and Inspection. The Maryland State Live Stock Board was abolished and its duties transferred to the state Board of Agriculture. A state agricultural society was incorporated in Maryland.

In Mississippi all farm products grown within the state were exempted for taxation for two years after harvesting, except for a levee tax on cotton. In the same state a system of registration was provided for brands of cattle, and the experiment station was directed to sell to residents at market prices its surplus pure-bred eggs, chickens, hogs, and bulls. Farm laborers in Virginia obtaining advances from employers and failing to render the labor promised were made liable to prosecution for larceny.

HORTICULTURE

E. J. Glasson

Crop Conditions. — Unseasonable weather conditions, particularly in the East, were again responsible for reduced crops in 1916. Although the country was fairly well supplied with fruits and vegetables the shortage was sufficient to favor the upward trend in prices so noticeable for all commodities. Export conditions improved somewhat, especially in the less perishable products. This resulted in cleaning up old stock and leaving the country dependent on current supplies.

The commercial apple crop was estimated at about 35,000,000 bbl., as compared with 40,000,000 bbl. in 1915. California shipped about 18,000,000 boxes of citrus fruits and 17,800 cars of fresh deciduous fruits, as compared with 18,675,000 boxes of citrus fruits and 16,500 cars of deciduous fruits in 1915. There were also shipped from California in 1916 5,500 cars of vegetables. The Florida citrus crop amounted to 8,657,000 boxes in 1916, as compared with 9,571,000 boxes in 1915. The white potato crop is estimated at 290,000,000 bus., as compared with 360,000,000 bus. in 1915. The 1915 pack of tomatoes, corn, and peas amounted to 8,469,000, 10,124,000, and 9,272,000 cases, respectively. The fall onion crop, which was a little better than the previous year, amounted to about 5,500,000 bus. in 1916.

Foreign Trade.—During the fiscal year ended June 30, 1916, the United States exported fruits, vegetables, and nuts worth $52,917,740, as compared with $45,746,268 in 1915. Imports of fruits, vegetables, and nuts in 1916 amounted to $55,257,700 as compared with $53,230,927 in 1915. The export figures are: Fruits, $36,073,051; vegetables, $15,952,412; and nuts, $892,277. The import figures are: Fruits, $23,285,816; vegetables, $10,811,393; and nuts, $21,160,491. The exports of fresh and dried apples dropped from $11,358,124 in 1915 to $6,822,996 in 1916. On the other hand, beans, peas, and potatoes worth $9,399,938 were exported in 1916, as compared with $5,984,257 in 1915. Exports of fresh fruits were more or less curtailed, partially on account of lack of shipping facilities and partially because of restrictive measures abroad. Lack of shipping facilities as well as lack of labor in those fruit-producing countries at war restricted somewhat this country's increase in imports. Exports of nursery stock increased from $170,218 in 1915 to $203,671 in 1916. Nursery stock worth $3,686,348 was imported in 1916, as compared with $3,748,666 worth in 1915.

Legislation and Court Decisions.—As a sequel to the standard apple-barrel law of 1915 (*A. Y. B.*, 1915, pp. 470, 473) a law which became effec-

tive on Nov. 1, 1916, fixes the standards for baskets and other small containers for small fruits, vegetables, and other commodities in interstate shipment (see *Agricultural Legislation, supra*). A decision of wide interest to shippers, rendered by the U. S. Supreme Court early in February, holds the carriers responsible for decline in market prices when fruits and vegetables fail to reach destination on schedule.

Nursery Stock Regulations.—New rules and regulations governing the importation of nursery stock in the United States were issued by the Federal Horticultural Board and became effective July 1. In the revised regulations the most important change is the provision which makes permits for the importation of nursery stock from countries which maintain nursery stock inspection, and for the importation of orchids and tree seeds from those which do not maintain such inspection, valid until revoked. Hitherto all permits for importation of nursery stock had to be renewed each year. The other changes in the regulations are chiefly minor and matters of form.

Market News Service.—As a result of successful preliminary work conducted in 1915, the Office of Markets and Rural Organization of the U. S. Department of Agriculture established early in 1916 a general market news service for perishable crops. The aim of the service is to furnish information in regard to as many of the factors affecting marketing as practicable to all persons and all organizations interested in the perishable products reported. Reports on car-lot shipments of perishables are received daily at Washington and immediately telegraphed to the principal market centers. Copies of the information are made available to national press associations and local papers, in an attempt to give as wide publicity as possible. Shipping data, morning quotations, and other information from 31 markets covered by the service are telegraphed directly to interested individuals and associations willing to pay the tolls. The commercial crops reported by the service during 1916 include strawberries, tomatoes, cantaloupes, peaches, onions, asparagus, watermelons, pears, prunes, grapes, apples, and white potatoes.

Rose Test Gardens.—With the view of stimulating interest in new and desirable varieties of roses, the American Rose Society has within the past year or two established a number of rose test gardens in which several plants of varieties to be tested are grown under comparable conditions, an annual inspection being made at the time of bloom. The principal gardens thus far established include those at Hartford, Conn., Minneapolis, Cornell University, and at Washington, D. C., the latter in conjunction with the U. S. Department of Agriculture.

Growing California Grapes in the East.—The New York State Experiment Station has found that many varieties of the European grape, commonly grown in California, can be grown in the eastern United States, provided they are grafted on phylloxera-resistant stock and given winter protection. The cheapest and most efficient method of protection used consisted in laying the vines down and covering with a few inches of earth.

Taming the Blueberry.—So much success has been secured by F. V. Coville in his cultural and breeding experiments with blueberries on a trial plantation of the U. S. Department of Agriculture in New Jersey, that blueberry culture is considered promising as a profitable industry to individual landowners in districts in which general agricultural conditions are especially hard and unpromising. In the New Jersey plantation hybrid seedlings have borne their first commercial crop when only three years old and a second crop three times as large as the first when four years old.

Tree Planting with Dynamite.—Recent experimental results in planting fruit trees with dynamite (*A. Y. B.*, 1912, p. 470) indicate that the profitable application of dynamite as a soil improver is limited. The gain in growth when compared with the extra cost of the method has not been sufficient to recommend the use of dynamite on soils well adapted for orcharding.

Painting Tree Wounds.—Evidence was recently secured by the New York State Experiment Station indicating that wounds on trees are often seriously aggravated by the materials applied to protect them. H. G. Cook announced a method of applying carbolineum or creosote oils to tree wounds that has been tested for several years with success. In this method a light charge of oil is brushed carefully on the wound from the heartwood out, leaving an unpainted circle near the sapwood from $\frac{5}{8}$ in. to 1 in. in width. In order to stimulate quick healing of the wound, the edge of the bark and sapwood is painted with a liquid wax composed of rosin and beef tallow in solution in alcohol.

Improved Spraying Practice.—An underground orchard piping system for conveying spray materials, recently used in a California orchard, has given satisfactory results. Summing up the evidence secured through a number of years at the Cornell Station it appears that the method of controlling the apple diseases and insect pests with dusting machines, although not quite as efficient as the liquid-spray method, is of especial value for use in small orchards which do not warrant the maintenance of expensive spraying equipment. (See also *Diseases of Plants*, and *Economic Entomology*, in this department, *supra.*)

Removing Spray Stains from Vegetables.—The Pennsylvania Experiment Station has devised a rapid method of cleaning tomatoes and other vegetables that are stained with Bordeaux mixture used in controlling fungus troubles. The vegetables are dipped in a solution of acetic acid, used at the rate of half a cupful if pure acid to two gallons of water. The newly-formed acetates are readily removed by passing the vegetables under running water.

Commercial Production of Thymol from Horsemint.—As a result of selection experiments with horsemint, conducted under the direction of the U. S. Department of Agriculture, an improved form more luxuriant in growth and with a higher thymol content than in the wild form has been secured. It is believed that the selection work has been carried far enough to warrant the use of this improved form for the commercial production of thymol in the United States.

Camphor Growing in Florida.—The European War has stimulated the production of camphor in Florida where the first commercial crop was harvested in 1913 (*A. Y. B.*, 1913, p. 472; 1914, p. 464). Early in the year it was reported that the Dupont Powder Co. had purchased the camphor plantation near Satsuma for $6,500,000.

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FORESTRY

E. J. Glasson

Operations Under the Weeks Law.—The Agricultural Appropriation Act for 1916 provides for the continuation of Appalachian forest purchases under the Weeks Law (*A. Y. B.*, 1911, p. 423), appropriating a million dollars for the fiscal year 1917 and two million dollars for the year 1918. For the present, purchases of land are to be confined to certain areas in the Appalachian region that are considered to be of the greatest benefit from the standpoint of watershed protection. These areas, which have all been examined by the U. S. Geological Survey, aggregate 6,966,304 acres. Up to June 30, 1916, 1,329,487 acres were approved for purchase by the National Forest Reservation Commission. As these lands are acquired they are administered along the same lines as are the national forests in the West. As soon as management plans are worked out they are to be formally designated as national forests.

Fire Protection.—With the passing of each year, through increased systematic forest fire protection by Federal, state and private agencies, often coöperating, the forest-fire situation in the big-timber regions continues to improve. Altogether more than one-hundred million acres are fairly well protected against forest fires at an average cost of less than two cents per acre. Twenty-one states now cooperate directly with the Government in protecting watersheds of navigable streams from fire. Partial returns for 1916 indicate a small loss for the year. In 1910, 4,800 fires caused a damage estimated at $25,000,000. In 1915, a year equally favorable for fires, 6,934 fires resulted in a damage of only $353,000. On the whole the fire-protection systems in Canada are good and are being constantly improved. Ontario is a notable exception. Late in July frightful forest fires in northern Ontario killed over 400 persons and injured many others, destroyed numerous villages, and burned large amounts of timber. A strong campaign is being waged by various agencies looking to a complete reorganization of the protective system in this province.

Forest Legislation.—Few new forestry measures were enacted by Congress and the States in 1916. A provision of the Federal Aid Road Act, which became a law on July 11, appropriates $1,000,000 a year for ten years for roads and trails within or partly within the national forests, in coöperation with the various states and counties concerned. Massachusetts provided for the purchase of about 1,000 acres on Mt. Toby to be used as a demonstration forest by the Massachusetts Agricultural College. An amendment to the conservation law of Louisiana provides that one-fifth of all licenses collected from the severance of timber and turpentine shall be accredited to the forestry department of the Department of Conservation for the execution of the forestry laws and for such purposes only; the forestry department is to be superintended by a technically trained forester. Quebec made several amendments to her fire laws adding materially to their strength.

National Forests.—Statistics corrected to June 30, 1916, show a total of 153 national forests in the United States, with a net area, including Alaska and Porto Rico, of 155,407,920 acres. In addition, 706,975 acres have been acquired by purchases in the White Mountain and southern Appalachian regions. During the above fiscal year the national forests' receipts from all sources were $2,823,540.71, as compared with $2,481,469.35 in 1915. Of the revenues in 1916, timber sales yielded $1,412,592.51, grazing $1,210,214.59, and special uses $200,733.61. Including appropriations under the new Federal Aid Road Act the total amount for roads, trails, and other improvements on the national forests during the fiscal year 1917 is $1,829,305.77. The protective force on the national forests totals 2,078 men, or about one man for every 75,000 acres; Prussia has one man for every 1,700 acres. During the fiscal year 1916 over 10,000 acres in national forests were planted or sown to trees. The trees are supplied by 21 Government nurseries, which have a present stock of

about 37,000,000 plants and are capable of supplying 15,000,000 a year.

Private Forestry.—Private forestry in the northern and western states is largely confined to the formation of fire-protective associations. At present there are 40 associations of this kind, including a few such organizations in the East. These associations are supported by assessments on an acreage basis and maintain a system of protection more or less similar to that on the national forests. Thus far the practice of forestry by private owners is confined principally to the northeastern states, where economic conditions, such as excellent nearby markets, low prices, rough land, and varied demand for forest products, combine to make the growing of trees profitable. Considerable planting is also being done by the farmers in the Middle West in the form of farm woodlots and windbreaks. Such tracts are already beginning to supply quantities of firewood and post material.

Wood Preservation.—A shortage in foreign supplies of coal-tar creosote is noticeable in the timber-treating industry of this country. A recent report by the American Wood Preservers' Association coöperating with the Forest Service shows that a total of 141,858,963 cub. ft. of timber were treated at 102 plants in 1915, a decrease in quantity from the 1914 output of 11 per cent. and from the 1913 output of about seven per cent. (see *A. Y. B.*, 1914, p. 466). In consequence of the development of the wood preserving industry in this country such woods as southern pine, Douglas fir, tamarack, and hemlock have been coming into use to replace white oak, chestnut, cedar, and cypress for railroad ties.

Schools and Associations.—According to the U. S. Forest Service, instruction in forestry may now be obtained in 52 institutions in the United States, 23 of which give courses leading to a degree in forestry. A greater effort is being made every year to increase the knowledge of forestry and forest trees in the lower grade schools. In some states, notably in Pennsylvania and New York, large areas were planted by school children during the year, the plants being furnished free of cost by the state. The Kentucky State Board of Forestry has offered prizes for essays on forestry of the children of the public schools. North Carolina has received a gift of a tract of land in the loblolly pine region to be used for experimental and demonstration forests. The Boy Scouts of Canada are to be supplied with forestry badges in return for a certain knowledge relative to forestry and forest activities to be determined by examination.

A new $40,000 forestry building has been erected at the Oregon Agricultural College. At the opening of the college in August the University of California commenced a new four-year course in forest or logging engineering. The Forest School of the Philippines has recently been separated from the College of Agriculture and made a distinct school under the University of the Philippines.

Charles Lathrop Pack was elected president of the American Forestry Association at Boston on Jan. 17. On Jan. 22 Dr. B. E. Fernow was elected president of the Society of American Foresters at the annual meeting in Washington, D. C.

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FISHERIES

HUGH M. SMITH

New England Vessel Fisheries.—The great vessel fisheries centering at Boston and Gloucester in 1915 supported a fleet of 410 steam, sail and gasoline vessels which landed 7,244 fares of fresh and salted fish. The catch aggregated 17,595,728 lb., valued at $4,737,917, an increase over 1914 of 9,006,508 lb. and $342,887. Cod decreased slightly from 1914, but most other products increased; mackerel increased 63 per cent. in quantity and 73 per cent. in value. The upward trend of the mackerel fishery has been marked, and the output in 1916 was the largest in 30 years. The otter-trawl fishery, with 12 steamers in 1915, yielded 21,116,300 lb., landed in 380 fares; one vessel in July took in one trip 310,000 lb. of fresh fish, the largest single catch by an American trawl vessel.

While the New England fleet ranges over a very wide area in search of fish, nearly 72 per cent. of the catch in 1915 came from grounds off the United States coast, 10 per cent. from the banks off Newfoundland, and 18 per cent. from grounds off Canadian provinces.

Shad and Alewife Fisheries.—The shad and alewives occur from Maine to Florida and are the principal river fishes of the Atlantic seaboard. The fisheries attain greatest extent in Delaware Bay and River, Chesapeake Bay and tributaries, and the North Carolina sounds. The supply has been imperiled by unrestricted fishing and by obstructions and pollutions, and the situation has demanded radical action of the respective states. The Hudson was formerly one of the leading shad streams; in 1896 the number of shad taken therein was 588,898; in 1916, according to a canvass made by the U. S. Bureau of Fisheries, only 9,287 shad were caught. In the Chesapeake region in 1915 only 1,454,535 lb. of shad was taken in Maryland as against over 7,000,000 in 1890 and 3,252,000 in 1909, and the alewife catch was 12,567,580 lb., as compared with 19,000,000 lb. in 1890 and 23,000,000 lb. in 1908; in Virginia there was taken 4,714,124 lb. of shad and 16,054,130 lb. of alewives, against a maximum catch of 11,500,000 lb. of shad in 1897 and 37,885,000 lb. of alewives in 1908. These fisheries in 1915 gave employment to 8,839 persons, with $1,528,824 invested capital, using 3,074 pound nets, 18,439 stake nets, and 2,297 drift gill nets; and the value of products was $1,155,670.

Crab Industry.—The common blue crab, most valuable and widely distributed of American crabs, is most abundant and of great commercial importance in Chesapeake Bay. Crab meat and live crabs are sent from Baltimore, Hampton, Crisfield, and other Chesapeake ports to nearly every state. The increasing magnitude of the fishery has occasioned concern for future supply, and full data collected for 1915 enable interested states to take suitable legislative action to prevent destruction of egg-bearing and young crabs. Persons employed in 1915 numbered 10,290; capital invested, $852,777; catch, 151,029,804 crabs (50,343,268 lb.), valued at $981,807. Crabs sold in a hard-shell condition numbered 123,770,469, valued at $578,127, while soft-shell crabs numbered 27,259,335 and yielded $403,678.

Fresh-water Mussel and Pearl Fisheries.—A canvass of the fresh-water mussel fishery was completed by Bureau of Fisheries in 1915. The mussel fishery is practically confined to Mississippi basin, and supports a pearl-button industry having an annual output of $6,000,000 to $10,000,000. Pearls are either sought especially or taken incidentally in the mussel fishery. Persons engaged in the industry numbered 10,331; capital invested was $540,608; products were 51,571 tons of shells, valued at $825,776, and pearls and slugs valued at $376,284.

Pacific Coast Fisheries.—The salmon fishery was more extensive in 1915 than in any previous year except 1913; 6,516,211 cases of canned fish were packed in American territory, including 1,269,206 on Puget Sound, 568,524 on Columbia River, 166,068 on minor rivers of Washington and Oregon, and 23,062 in California. The

halibut fishery, ranking next to salmon and having the largest fleet of vessels (100), yielded 50,238,390 lb. (33,133,313 lb. landed at Seattle, 11,323,500 lb. in Canadian ports, and 5,781,577 lb. in Alaska), against 48,902,575 lb. in 1914. The cod fleet numbered 20 sail and caught 3,798,071 fish (equivalent to 19,092,319 lb.), a slight decrease from 1914.

Alaska fisheries in 1915 were more extensive than ever before. The value of products was slightly less than in 1914 but the quantity was more. Persons employed numbered 22,462; capital invested, $37,316,560, of which the salmon industry represented $32,106,296; value of products, $20,999,343, divided as follows: canned salmon, $18,653,015; fresh, frozen and cured salmon, $561,130; halibut, $802,011; cod, $390,199; herring (fish, oil and fertilizer), $155,579; whale oil and fertilizer, $381,750; miscellaneous, $55,659. The salmon catch was 63,537,244 fish, of which 25,878,811 were red salmon and 30,896,394 humpback salmon. Salmon canneries numbered 81, and the pack was 4,500,293 cases of 48 one-pound cans, the largest in the history of Alaska. The fishery in 1916, however, was still more extensive, and canned salmon pack was approximately 4,700,000 cases.

Alaskan Seal Industry.—Continuation of close time (till August, 1917) on commercial sealing has restricted killing to primitive methods of Pacific coast Indians and limited needs of the seal-island natives. In 1916 about 7,000 skins of surplus male seals, whose carcasses had served as food, were shipped from the islands. The herd continues to increase; the census in 1916 showed 417,329 seals of all ages, of which 116,977 were new-born pups. The increase over 1915 was 53,457.

The market for raw Alaskan seal skins, for many years confined to London, has been transferred to St. Louis; and the dressing and dyeing of such skins, by a special and laborious process heretofore practised only in London, has likewise been established in St. Louis. The first dressed and dyed seal skins prepared after the London method were sold at public auction in St. Louis in September, 1916, for account of the U. S. Government.

New Fisheries Established.—Following immediately a publicity campaign waged by the Bureau of Fisheries, a new fishery was established for tilefish in November, 1915, and in 12 months had yielded over 10,000,000 lb. of this excellent food fish, with a romantic history, not previously in our markets. The money returns to the fishermen aggregated over $400,000.

Congress in July, 1916, appropriated $25,000 to enable the Commissioner of Fisheries to conduct investigations looking to amelioration of damage by predaceous fishes, particularly dogfish, a hitherto unutilised food. Practical demonstrations have shown the great economic value of dogfish (now called grayfish); canning has begun, and fishermen now find sale for an enormous incidental catch formerly discarded.

STATISTICS OF AGRICULTURE

WORLD'S PRODUCTION OF PRINCIPAL CROPS, 1904–1915

(Yearbook of the Department of Agriculture)

	1904	1909	1913	1914	1915
Barley (bus.)	1,175,784,000	1,458,263,000	1,650,265,000	1,386,283,000	1,542,972,000
Corn (bus.)	3,109,252,000	3,563,226,000	3,587,429,000	3,864,279,000	.....
Cotton (bales)	21,005,175	20,679,334	.....	.....	.....
Flaxseed (bus.)	107,743,000	100,820,000	131,327,000	.....	.....
Hops (lb.)	178,802,000	128,173,000	173,937,000	[1]234,826,000	.....
Oats (bus.)	3,611,302,000	4,312,882,000	4,697,437,000	4,022,486,000	4,783,778,000
Potatoes (bus.)	4,298,049,000	5,595,567,000	.....	.....	.....
Rice (lb.)	115,735,800,000	127,700,000,000	100,700,000,000	.....	.....
Rye (bus.)	1,742,112,000	1,747,123,000	1,880,387,000	1,574,602,000	1,711,158,000
Sugar (long tons)	12,271,659	14,289,100	17,975,197	.....	.....
Tobacco (lb.)	2,146,641,000	2,742,500,000	2,722,190,030[1]	.....	.....
Wheat (bus.)	3,163,542,000	3,581,519,000	4,127,437,000	3,619,466,000	4,216,806,000

[1] Preliminary.

WORLD'S PRODUCTION OF PRINCIPAL CROPS, BY COUNTRIES, 1904–1915

(*Yearbook of the Department of Agriculture*)

	1904 Production (000 omitted)	1909 Production (000 omitted)	1913 (000 omitted)		1914 (000 omitted)		1915 (000 omitted)	
			Acres	Production	Acres	Production	Acres	Production
Barley (bus.):								
Algeria	37,106	31,511	3,152	50,031	3,131	35,785	2,703	39,866
Austria-Hungary	119,451	153,582	6,007	162,602	.....	145,205	.....	136,186
Canada	43,872	55,398	1,613	48,319	1,496	36,201	1,509	50,868
France	38,827	46,144	1,878	46,116	1,780	44,818	1,760	36,248
Germany	135,409	160,551	4,087	168,709	3,909	144,125	[2]	150,000
Japan	80,000	87,219	3,302	101,559	.....	.....	.....	93,417
Russia (European)	343,981	464,734	30,165	557,593	31,065	398,068	29,748	475,109
Spain	60,000	81,579	3,869	68,772	3,404	72,272	3,786	82,763
United Kingdom	64,474	71,116	1,930	67,778	1,870	66,637	1,524	48,682
United States	139,749	173,321	7,499	178,189	7,565	194,953	7,395	237,009
Corn (bus.):								
Argentina	175,189	177,155	9,464	196,642	10,260	263,135	10,386	338,235
Austria-Hungary	89,757	210,241	8,723	226,492	[2]	216,308	[2]	[2]
Bulgaria	12,758	20,472	1,568	33,200	1,571	30,901	[2]	35,000
Canada	20,242	19,263	278	16,773	256	13,924	253	14,594
Egypt	30,000	65,000	1,923	57,044	1,763	78,253	1,907	[2]
France	19,482	26,075	1,133	21,078	1,128	22,530	766	14,000
Italy	90,546	99,289	3,888	108,388	3,680	105,006	3,954	118,103
Mexico	83,131	170,000	[5]6,093	82,519	4,748	78,443	[2]	60,000
Roumania	19,598	70,138	5,305	114,662	5,104	105,552	5,207	110,230
Russia	25,920	39,598	4,210	72,793	4,043	80,608	4,036	74,806
Serbia	9,498	34,453	1,445	23,621	[2]	20,000	[2]	[2]
South Africa	8,784	20,000	.....	[3]30,830	[2]	[3]30,830	[2]	[3]30,830
Spain	21,255	26,433	1,105	25,140	1,137	30,325	1,140	25,327
United States	2,467,481	2,552,190	105,820	2,446,988	103,435	2,672,804	108,321	3,054,535
Cotton (bales):								
Brazil	220	265	.....	320	[2]	385	.....	.....
French Indo-China	1,200	1,200	.....	.....	.....	.....	.....	.....
Egypt	1,305	1,045	1,788	1,561	1,822	1,451	.....	.....
India	3,727	4,123	22,028	3,858	25,020	4,238	.....	.....
Mexico	253	200	.....	200	.....	.....	.....	.....
Persia[4]	71	128	[2]	[2]	.....	.....	.....	.....
Peru	45	44	[2]	[4]110	[2]	106	.....	.....
Russia (Asiatic)	504	418	1,383	957	1,476	1,051	.....	.....
Turkey (Asiatic)	66	131	.....	.....	.....	.....	.....	.....
United States	13,439	10,005	37,089	14,157	36,832	16,135	.....	.....
Hops (lb.)								
Australasia	.....	2,206	1,383	2,078	.....	2,110	.....	.....
Austria-Hungary	.....	20,577	56	23,315	[2]	[2]	.....	.....
Belgium	.....	3,861	6	7,395	6	7,560	.....	.....
France	.....	5,029	7	8,028	7	7,034	.....	.....
Germany	.....	13,356	67	23,408	68	55,227	.....	.....
Russia	.....	8,267	24	16,973	24	14,084	.....	.....
United Kingdom	.....	24,022	36	28,632	37	56,813	.....	.....
United States	.....	50,697	[2]	62,899	[2]	43,415	.....	.....
Oats (bus.):								
Argentina	.....	31,984	2,487	75,783	3,087	50,981	2,869	63,392
Austria-Hungary	177,523	251,277	8,146	270,834	.....	243,537	.....	234,925
Canada	202,827	353,466	10,434	404,669	10,061	313,078	11,365	481,035
Denmark	40,000	42,170	[2]	46,755	[2]	38,653	1,024	42,874
France	261,264	331,183	9,833	311,157	8,873	261,196	9,051	243,531
Germany	477,852	628,712	10,967	669,231	10,843	622,674	[2]	650,000
Russia	1,081,034	1,145,387	47,709	1,225,732	46,924	866,543	44,787	1,406,983
Sweden	50,117	69,292	1,974	99,815	1,960	52,557	[2]	70,000
United Kingdom	191,565	184,370	3,961	180,647	3,879	180,241	4,149	195,169
United States	894,596	1,007,129	38,399	1,121,768	38,442	1,141,060	40,780	1,540,362
Potatoes (bus.):								
Austria-Hungary	639,407	682,927	4,926	627,728	.....	.....	.....	.....
Belgium	82,846	90,358	395	117,613	.....	.....	.....	.....
Canada	74,746	99,085	474	78,544	476	85,672	.....	.....
France	375,000	613,041	3,825	499,194	3,676	440,652	.....	.....
Germany	1,702,803	1,716,143	8,432	1,988,591	8,367	1,674,377	.....	.....
Italy	29,000	63,273	722	65,741	727	61,104	.....	.....
Netherlands	96,695	97,275	420	109,260	416	120,780	.....	.....
Russia	1,082,723	1,204,528	11,919	1,302,847	1,200	[6] 96,531	.....	.....
Spain	84,000	98,860	[2]	.....	688	76,657	.....	.....
Sweden	78,020	61,981	383	75,367	376	63,209	.....	.....
United Kingdom	265,713	256,752	1,173	283,912	1,197	279,121	.....	.....
United States	278,985	389,195	3,668	331,525	3,711	409,921	.....	.....

[1] Area refers to 1910. [2] No official statistics. [3] Census figures of 1911. [4] Exports
[5] Area and production, 1912. [6] Omitting Poland.

WORLD'S PRODUCTION OF PRINCIPAL CROPS, BY COUNTRIES—*Continued*

	1904 Production (000 omitted)	1909 Production (000 omitted)	1913 (000 omitted)		1914 (000 omitted)		1915 (000 omitted)	
			Acres	Production	Acres	Production	Acres	Production
RICE (lb.):								
Egypt	141,000	653,458	252	505,118	37	81,229	.....	.....
Formosa	2,598,100	1,446,000	1,221	1,610,461	[4]	[4]	.....	.....
FrenchIndo-China	5,000,000	5,000,000	.....	.....	.....	.....	.....	.....
India	72,325,000	86,712,000	75,425	64,490,272	76,181	62,638,912	.....	.....
Italy	760,500	647,000	362	739,221	361	741,203	.....	.....
Japan	18,658,700	16,375,000	7,425	15,787,969	7,434	17,827,240	.....	.....
Java and Madura	6,431,000	7,566,000	6,309	7,951,049	[4]	[4]	.....	.....
Korea	3,200,000	3,200,000	[4]	3,050,798	[4]	3,678,878	.....	.....
Madagascar[2]	.....	953,000	.....	953	.....	.....	.....	.....
Philippine Islands	544,000	1,018,000	2,820	1,512,299	3,076	1,403,516	.....	.....
Siam	6,824,000	6,824,000	.....	[3]3,214,258	.....	.....	.....	.....
Spain	394,600	282,065	96	303,310	97	336,925	.....	.....
United States	619,400	702,709	827	715,111	694	656,917	.....	.....
RYE (bus.):								
Austria-Hungary	138,009	164,898	7,752	164,529	.....	139,910	.....	154,075
Belgium	22,000	23,154	641	22,463	645	21,000	[4]	18,000
Bulgaria	13,000	6,906	515	9,401	501	6,976	[4]	7,622
Canada	2,995	1,715	119	2,300	111	2,017	113	2,478
Denmark	18,000	18,922	607	16,637	[4]	10,905	521	12,989
Finland	.....	12,085	[4]	10,289	[4]	10,806	[4]	10,000
France	53,343	54,934	2,905	49,452	2,614	43,884	2,603	40,307
Germany	396,075	446,763	15,849	481,169	15,565	410,478	[4]	475,000
Netherlands	14,000	17,652	562	16,895	563	13,471	549	13,727
Russia	1,008,381	896,833	71,882	971,960	69,517	806,000	69,024	861,097
Spain	19,000	34,901	1,917	27,916	1,877	23,950	1,858	28,664
Sweden	20,960	25,728	911	22,266	981	27,599	[4]	25,000
United States	27,242	29,520	2,557	41,381	2,541	42,779	2,856	49,190
SUGAR, CANE (short tons):								
Australia	127	185	.....	127	.....	263	.....	269
Brazil	221	273	.....	228	.....	228	.....	269
Cuba	1.165	1,704	.....	2,737	.....	2,910	.....	2,980
India	19	1,097	.....	2,894	.....	2,534	.....	2,651
Java	991	1,369	.....	1,616	.....	1,591	.....	.....
Mauritius	241	215	.....	239	.....	271	.....	303
United States	754	1,226	.....	1,108	.....	1,276	.....	[6]247
BEET (short tons):								
Austria-Hungary	.....	1,529	.....	2,096	.....	1,858	.....	1,289
Belgium	227	272	.....	309	.....	249	.....	224
France	900	785	.....	953	.....	861	.....	[7]334
Germany	2,158	2,292	.....	2,902	.....	2,886	.....	2,756
Netherlands	.....	217	.....	309	.....	253	.....	264
Russia	1,351	1,242	.....	1,344	.....	2,031	.....	.....
United States	233	426	.....	693	.....	733	.....	722
TOBACCO (lb.):								
Austria-Hungary	111,815	190,274	.....	173,349	.....	.....	.....	.....
Brazil[6]	52,832	64,654	[4]	64,788	[4]	59,481	.....	.....
Cuba	42,421	59,323	[4]	72,585	[4]	72,585	.....	.....
Dutch East Indies	90,125	134,100	[4]	[5]45,024	[4]	[4]	.....	.....
Germany	75,797	62,120	35	56,953	25,404	[4]	.....	.....
India	450,000	450,000	965	[4]	1,002	[4]	.....	.....
Japan	106,075	91,850	77	111,955	89	115,742	.....	.....
Philippine Islands	33,100	40,258	170	101,545	150,459	103,024	.....	.....
Russia	204,298	207,451	154	202,020	[4]	[4]	.....	.....
Santo Domingo	.....	30,000	[4]	28,000	.....	.....	.....	.....
Turkey (Europe)	.....	49,177	.....	.....	.....	.....	.....	.....
United States	665,461	1,065,765	1,216	953,734	1,224	1,035	.....	.....
WHEAT (bus.):								
Argentina	120,598	156,162	17,096	187,391	16,243	113,904	15,471	178,221
Austria-Hungary	203,998	186,083	11,854	232,193	.....	170,453	.....	230,934
Australasia	84,627	73,612	7,529	100,223	9,453	112,159	10,551	32,480
Canada	76,427	166,744	11,016	231,717	10,293	161,280	12,986	336,258
France	296,606	356,193	16,166	321,000	14,975	282,689	14,743	258,102
Germany	139,803	137,999	4,878	171,075	4,932	145,944	[4]	160,000
India	357,162	285,189	29,524	362,693	28,475	312,032	32,230	383,376
Italy	150,400	190,378	11,842	214,405	11,783	169,442	12,502	170,541
Roumania	53,738	56,751	4,011	83,236	5,218	49,270	4,705	89,241
Russia	706,706	783,270	74,429	952,605	75,902	746,873	73,327	833,965
Spain	110,000	144,105	9,644	112,401	9,681	116,089	10,037	139,298
United Kingdom	39,083	65,188	1,790	58,441	1,905	64,356	2,335	76,358
United States	552,400	683,530	50,184	763,380	53,541	891,017	59,898	1,011,505

[1] Year preceding. [2] Data for 1908. [3] Data for 1912. [4] No official statistics.
[5] Exports. [6] Continental U. S. only. [7] Refined sugar.

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, 1904–1916

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904 (census)	1909 (census)	1913	1914	1915	1916[1]
TOTAL:						
Barley (bus.)	139,749	173,321	178,189	194,953	228,851	180,927
Buckwheat (bus.)	15,008	14,849	13,833	16,881	15,056	11,840
Corn (bus.)	2,467,481	2,552,190	2,446,988	2,672,804	2,944,793	2,583,241
Cotton (500-lb. bales)[2]	13,438	10,005	14,156	16,135	11,192	11,511
Flaxseed (bus.)	23,401	19,513	17,853	13,749	14,030	15,459
Hay (tons)	60,696	68,833	64,116	70,071	85,920	89,991
Hops (lb.)	49,359	50,697	62,899	43,415	52,986	50,537
Oats (bus.)	894,596	1,007,129	1,121,768	1,141,060	1,549,030	1,251,992
Potatoes (bus.)	332,830	389,195	331,525	409,921	359,721	285,437
Rice (bus.)	21,096	21,839	25,744	23,649	28,947	41,982
Rye (bus.)	27,242	29,520	41,381	42,779	54,050	47,383
Sugar (short tons)	657	888	1,034	969	1,224	1,224
Tobacco (lb.)	660,461	1,055,765	953,734	1,034,679	1,062,237	1,150,622
Wheat (bus.)	552,400	683,366	763,380	891,017	1,025,801	639,886
AVERAGE PER ACRE:						
Barley (bus.)	27.2	22.5	23.8	25.8	32.0	23.6
Buckwheat (bus.)	18.9	16.9	17.2	21.3	19.6	14.0
Corn (bus.)	26.8	25.9	23.1	25.8	28.2	24.4
Cotton (lb.)	204.9	154.3	182.0	209.2	170.3	156.3
Flaxseed (bus.)	10.3	9.4	7.8	8.4	10.1	9.6
Hay (tons)	1.52	1.35	1.31	14.3	1.68	1.64
Oats (bus.)	32.1	28.6	29.2	29.7	37.8	30.1
Potatoes (bus.)	110.4	106.1	90.4	110.5	96.3	80.4
Rice (bus.)	31.9	35.8	31.1	34.1	36.1	47.8
Rye (bus.)	15.2	13.4	16.2	16.8	17.3	15.3
Tobacco (lb.)	819.0	815.3	784.3	845.7	775.4	815.0
Wheat (bus.)	12.5	15.4	15.2	16.6	17.0	12.1

[1] Final estimate issued December 15.

[2] Excluding linters.

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, BY STATES, 1904–1915

(*Yearbook of the Department of Agriculture*)

	1904		1909		1913		1914		1915	
	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)
BARLEY (bus.):										
California	22.7	28,091	26.5	31,270	26.0	33,150	30.0	42,060	29.0	39,440
Idaho	37.4	1,707	40.0	2,480	42.0	7,560	38.0	7,030	40.5	7,736
Iowa	27.8	13,552	22.0	10,890	25.0	10,000	26.0	9,360	31.0	10,943
Minnesota	28.4	32,123	23.6	31,600	24.0	34,800	23.0	31,694	30.5	20,176
N. Dakota	28.1	17,518	21.0	20,727	20.0	25,500	19.5	28,275	32.0	19,712
S. Dakota	28.0	9,787	19.5	19,910	17.5	16,765	23.0	19,550	32.0	11,040
Washington	34.8	5,824	39.5	7,189	40.5	7,290	39.0	7,098	41.5	4,067
Wisconsin	30.0	14,941	28.0	24,248	25.0	18,125	27.3	18,428	35.5	13,041
CORN (bus.):										
Alabama	15.0	41,877	13.5	30,696	17.3	55,360	17.0	55,488	17.0	66,300
Georgia	11.9	47,234	13.9	39,375	15.5	63,023	14.0	56,000	15.0	64,950
Illinois	36.5	344,133	36.9	390,219	27.0	282,150	29.0	300,034	36.0	376,164
Indiana	31.5	143,396	40.0	195,496	36.0	176,400	33.0	163,317	38.0	190,950
Iowa	32.6	303,039	31.5	341,750	34.0	338,300	38.0	389,424	30.0	303,000
Kansas	20.9	134,609	19.9	154,652	3.2	23,424	18.5	108,225	31.0	172,050
Kentucky	26.9	86,815	29.0	83,348	20.5	74,825	25.0	91,250	30.0	114,000
Michigan	28.6	36,990	35.4	52,907	33.5	56,112	36.0	63,000	32.0	56,000
Minnesota	26.9	41,809	34.8	67,897	40.0	96,000	35.0	91,000	23.0	91,000
Mississippi	19.1	39,709	14.5	28,429	20.0	63,000	18.5	58,275	19.0	69,350
Missouri	26.2	151,522	26.4	191,427	17.5	129,062	22.0	158,400	29.5	209,450
Nebraska	32.8	260,942	24.8	180,133	15.0	114,150	24.5	173,950	30.0	213,000
Ohio	32.5	99,628	39.5	157,513	37.5	146,250	39.1	142,715	41.5	156,040
Pennsylvania	34.0	48,535	32.0	41,494	39.0	57,057	42.5	62,178	38.5	58,520
S. Dakota	28.1	43,855	31.7	55,559	25.5	67,320	26.0	78,000	29.0	94,250
Tennessee	25.0	80,890	22.0	67,682	20.5	68,675	24.0	80,400	27.0	94,500
Texas	22.6	136,702	15.0	75,499	24.0	163,200	19.5	124,800	23.5	175,075
Wisconsin	29.7	45,119	33.0	49,163	40.5	66,825	40.5	69,862	23.0	40,825

PRODUCTION OF PRINCIPAL CROPS IN THE UNITED STATES, BY STATES, 1904–1915—*Continued*

	1904		1909		1913		1914		1915	
	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)	Average per Acre	Total (000 omitted)
COTTON (bales):										
Alabama	36	1,448	28	1,024	.....	1,494	.....	1,750	1.48	1,050
Georgia	41	1,888	36	1,804	.....	2,317	.....	2,713	1.93	1,900
Mississippi	44	1,798	31	1,083	.....	1,311	.....	1,245	1.70	940
N. Carolina	46	704	42	601	.....	793	.....	925	2.70	708
Oklahoma	49	804	29	545	.....	840	.....	1,261	1.55	630
S. Carolina	43	1,151	42	1,100	.....	1,378	.....	1,525	2.31	1,160
Texas	36	3,146	.25	2,523	.....	3,945	.....	4,585	1.49	3,175
HAY (tons):										
Iowa	1.62	5,074	1.64	5,983	1.48	4,440	1.38	4,071	15.66	5,576
Michigan	1.25	2,658	1.30	3,403	1.05	2,520	1.28	3,011	17.08	3,458
New York	1.36	6,480	1.05	5,002	1.14	5,358	1.20	5,584	20.41	91,845
Ohio	1.43	3,880	1.43	4,033	1.30	3,848	1.13	3,178	18.29	51,422
Pennsylvania	1.45	4,499	1.20	3,742	1.32	4,146	1.28	4,020	21.84	67,704
Wisconsin	1.67	2,959	1.53	3,625	1.62	3,848	1.75	4,462	17.32	44,629
OATS (bus.):										
Illinois	32.0	117,341	36.6	150,386	23.8	104,125	29.3	125,990	45.0	195,435
Iowa	32.0	122,323	27.0	128,198	34.5	168,360	33.0	165,000	40.0	198,000
Ohio	40.9	49,733	32.5	57,591	30.2	54,360	30.5	50,325	41.0	69,003
Minnesota	39.2	85,178	33.0	93,898	37.8	112,644	28.0	85,120	43.0	134,375
N. Dakota	37.4	31,010	32.0	65,887	25.7	57,825	28.0	64,904	40.0	98,000
Wisconsin	35.0	86,734	35.0	71,336	36.5	83,038	27.0	62,100	46.5	99,975
POTATOES (bus.):										
Iowa	136.0	22,354	89.0	12,905	48.0	7,200	86.0	12,642	105.0	15,540
Maine	215.0	19,657	225.0	29,250	220.0	28,160	260.0	33,800	155.0	22,010
Michigan	121.0	31,806	105.0	36,540	96.0	33,600	121.0	44,044	59.0	20,945
Minnesota	102.0	13,995	115.0	18,400	110.0	30,250	114.0	30,780	106.0	30,210
New York	93.0	41,129	120.0	52,560	74.0	26,640	145.0	53,215	62.0	22,010
Ohio	98.0	16,029	93.0	16,926	64.0	10,240	95.0	14,250	82.0	12,546
Pennsylvania	106.0	27,174	78.0	23,790	88.0	23,320	105.0	28,140	72.0	20,160
Wisconsin	126.0	31,499	102.0	26,724	109.0	32,155	124.0	37,696	87.0	25,926
RICE (bus.):										
Arkansas	.....	.....	40.0	1,120	36.0	3,769	39.8	3,685	48.4	4,840
Louisiana	30.4	11,445	33.8	12,675	29.0	11,760	32.1	10,802	34.2	13,714
Texas	35.5	8,314	34.0	9,894	32.0	9,696	33.8	8,102	30.5	7,930
RYE (bus.):										
Indiana	14.6	478	16.5	940	15.2	1,566	16.3	1,614	16.0	2,400
Michigan	13.2	1,752	15.5	5,425	14.3	5,362	16.0	5,936	15.5	6,045
Minnesota	17.7	1,648	19.0	2,280	19.0	5,700	18.8	5,245	19.5	5,850
New Jersey	17.5	1,224	16.3	1,288	18.0	1,260	18.5	1,295	20.0	1,420
New York	14.8	2,177	17.0	2,720	17.2	2,288	17.7	2,283	18.7	2,805
Pennsylvania	15.5	5,367	15.3	5,508	17.5	4,900	18.0	5,040	18.0	4,932
Wisconsin	16.2	4,905	16.3	4,727	17.5	7,438	16.5	6,798	18.5	7,770
TOBACCO (lb.):										
Connecticut	1,685	21,407	1,650	22,110	1,550	28,520	1,770	35,754	1,350	29,970
Indiana	691	4,314	950	19,000	750	11,925	900	12,150	840	11,340
Kentucky	827	229,417	835	350,700	760	281,200	910	364,000	810	356,400
Maryland	621	19,913	710	17,750	740	18,500	800	17,600	740	16,280
N. Carolina	685	98,618	600	144,000	670	167,500	650	172,250	620	198,400
Ohio	849	50,793	925	83,250	750	61,425	900	78,120	900	84,330
Pennsylvania	1,289	18,635	985	30,732	1,200	46,680	1,450	47,995	1,350	42,390
S. Carolina	703	8,185	800	32,000	760	33,288	730	36,500	580	37,700
Tennessee	730	34,823	730	53,290	720	64,800	820	63,468	750	69,675
Virginia	725	96,487	775	120,125	770	154,000	650	113,750	750	144,375
W. Virginia	710	2,901	875	12,600	680	10,200	820	8,856	870	9,831
Wisconsin	1,282	52,473	1,180	37,170	1,180	50,740	1,180	53,808	900	36,900
WHEAT (bus.):										
Illinois	13.8	21,542	17.4	37,831	18.7	41,888	18.5	46,250	19.0	53,200
Indiana	9.2	12,525	15.3	33,936	18.5	39,775	17.4	43,239	17.2	47,300
Kansas	12.4	65,019	14.4	77,564	13.0	86,983	20.5	117,200	12.5	106,538
Michigan	9.8	6,873	18.8	16,026	15.3	12,776	19.7	17,316	21.3	20,440
Minnesota	12.8	68,344	16.8	57,094	16.2	68,040	10.6	42,975	17.0	73,420
Missouri	17.7	27,163	14.7	29,837	17.1	39,586	17.0	43,333	12.3	34,108
Nebraska	13.6	31,453	18.8	47,686	17.9	62,325	18.6	68,116	18.3	72,154
N. Dakota	11.8	53,892	13.7	116,782	10.5	78,855	11.2	81,592	18.2	151,970
Ohio	11.5	17,563	15.9	30,664	18.0	35,100	18.5	36,538	20.3	40,194
Pennsylvania	14.1	21,857	17.0	21,564	17.0	21,862	18.1	23,747	18.5	24,605
Washington	22.2	32,140	23.2	40,920	23.2	53,300	23.5	41,840	25.2	50,394

IMPORTS AND EXPORTS OF IMPORTANT AGRICULTURAL PRODUCTS, 1904–1916

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904	1909	1913	1914	1915	1916
IMPORTS						
Total, excluding Forest Products	$461,434	$638,612	$815,301	$924,247	$910,876	$1,186,642
Animal matter:						
Cattle	310	1,999	6,641	18,697	17,513	15,188
Horses	1,460	2,007	2,126	2,605	977	1,618
Sheep	815	502	90	532	534	918
Other animals including fowls	543	528	729	2,878	3,255	926
Butter	34	141	304	1,753	977	212
Cheese	3,284	5,866	9,185	11,011	9,370	7,058
Cream	.....	.....	1,068	1,550	1,800	1,043
Milk	32	23	136	1,089	2,557	1,515
Eggs	61	36	206	1,060	439	111
Silk	46,100	79,903	84,915	100,930	83,131	124,334
Wool	24,813	45,171	35,580	53,191	68,243	142,421
Packing-house products:						
Hides and skins	52,006	78,487	117,386	120,290	104,177	158,861
Meat	935	796	1,427	20,402	25,398	11,063
Vegetable matter:						
Cocoa	9,174	15,222	17,389	20,798	22,893	35,144
Chocolate	426	339	788	706	585	660
Coffee	69,551	79,112	118,963	110,725	106,766	115,486
Vegetable fibers:						
Cotton	8,541	13,622	22,987	19,457	23,209	40,150
Flax	2,541	2,542	3,950	2,870	1,876	3,508
Hemp	869	799	1,484	1,564	1,156	1,642
Jute	4,104	7,216	9,281	11,174	4,677	7,915
Manila	11,423	7,156	12,630	9,780	9,201	14,067
Sisal grass	15,935	10,215	17,804	25,861	20,572	25,803
Fruits	18,964	22,446	28,657	33,638	27,081	23,286
Corn	10	189	491	7,917	6,083	2,865
Oats	57	2,651	289	7,886	290	303
Wheat	7	36	560	1,762	470	5,789
Wheat flour	164	446	454	364	310	1,689
Hay	914	60	1,514	1,634	229	679
Hops	1,374	1,337	2,853	2,791	2,779	145
Distilled spirits	4,957	7,676	7,374	7,264	5,570	7,232
Malt liquors	2,313	3,215	3,290	2,967	1,587	1,457
Wines	9,391	12,276	10,079	10,117	6,247	7,997
Nursery stock	1,496	1,946	3,207	3,597	3,749	3,686
Nuts	5,471	8,664	13,966	19,783	16,820	11,160
Oils, vegetable	11,179	18,238	28,130	32,321	24,781	33,919
Rice, rice meal, etc	3,073	4,698	5,917	7,474	6,304	6,094
Sago, tapioca, etc	695	1,396	2,187	1,642	1,434	2,227
Seeds	3,587	5,958	17,426	20,084	23,055	33,572
Spices	4,366	5,348	6,187	5,596	5,927	8,947
Sugar	71,915	96,554	103,640	101,649	173,993	208,769
Tea	18,229	18,562	17,434	16,735	17,513	20,600
Tobacco	16,939	25,405	35,919	35,039	27,157	24,619
Vegetables	7,008	12,999	11,359	15,134	9,330	10,811
EXPORTS						
Total, excluding Forest Products	859,160	903,238	1,123,652	1,113,974	1,475,938	1,509,818
Animal matter:						
Cattle	42,256	18,046	1,177	647	703	2,384
Horses	3,189	3,386	3,960	3,389	64,047	73,531
Mules	412	472	734	691	12,726	22,946
Sheep	1,954	365	606	535	182	232
Swine	53	144	152	134	93	239
Other live animals[1]	111	114	452	408	203	331
Butter	1,768	1,268	873	877	2,392	3,592
Cheese	2,452	857	441	414	8,463	7,430
Milk, condensed	1,367	1,375	1,433	1,341	3,067	12,404
Eggs	396	1,199	4,392	3,734	5,004	6,134
Packing-house products:						
Beef, canned	5,882	1,645	858	462	11,973	9,353
Beef, cured	3,281	3,472	2,490	2,290	3,383	4,034
Beef, fresh	26,841	12,698	902	789	21,732	28,886
Hides and skins	3,246	1,271	3,450	2,807	4,686	3,875
Lard	46,347	52,712	63,317	57,773	55,462	51,684
Lard compounds	3,581	6,115	5,916	5,489	6,046	5,147
Pork, cured	56,268	54,046	52,988	54,543	81,287	126,171
Pork, fresh	1,669	938	311	359	474	7,523

[1] Including fowls.

IMPORTS AND EXPORTS OF IMPORTANT AGRICULTURAL PRODUCTS—*Continued*

(*Yearbook of the Department of Agriculture*)

(000 omitted)

	1904	1909	1913	1914	1915	1916
EXPORTS—*Continued*						
Vegetable matter:						
Cotton	$372,049	$417,390	$547,357	$610,475	$376,218	$374,186
Fruits	20,348	16,079	36,346	31,031	34,230	36,073
Barley	6,292	4,672	11,412	4,253	18,184	20,664
Buckwheat	.....	.....	2	1	397	481
Corn	30,071	25,194	28,801	7,008	39,339	30,780
Oats	475	804	13,206	758	57,469	47,993
Rye	440	1,049	1,260	1,555	14,733	15,374
Wheat	35,850	68,094	89,036	87,953	333,552	215,533
Cornmeal	1,691	1,549	1,445	1,186	1,923	1,601
Oatmeal	463	516	1,515	569	2,416	1,886
Wheat flour	68,894	51,157	53,172	54,454	94,869	87,348
Total grain and grain products	76,215	160,076	210,524	164,815	572,951	430,744
Hops	2,116	1,271	4,765	6,954	3,948	4,384
Distilled spirits	1,691	1,883	2,218	2,276	1,982	11,062
Malt liquors	854	1,010	1,371	1,485	1,082	1,065
Oil cake	17,069	25,836	29,444	21,668	28,879	28,541
Vegetable oils	12,618	23,098	24,044	16,251	25,832	27,167
Seeds	2,583	5,256	3,565	3,191	3,861	3,539
Sugar	532	2,785	1,681	1,840	25,615	79,390
Tobacco	29,640	30,902	49,354	53,964	44,494	53,164
Vegetables	2,603	3,760	7,354	6,936	10,813	15,952

AVERAGE PRICES OF AGRICULTURAL PRODUCTS, 1904–1916

(*Yearbook of the Department of Agriculture*)

	1904	1909	1913	1914	1915	1916
FARM CROPS:[1]						
Barley (bus.)	$0.42	$0.54	$0.537	$0.543	$0.517	$0.882
Beans (bus.)[2]	1.72½–2.20	2.25–2.75	2.15–2.60	2.10–3.10	2.85–4.10	3.80–7.25
Buckwheat (bus.)	0.622	0.701	0.755	0.764	0.787	1.129
Corn (bus.)	0.441	0.579	0.691	0.644	0.575	0.889
Cotton (lb.)	0.0873	0.139	0.122	0.068	0.112	0.196
Flaxseed (bus.)	0.993	1.529	1.199	1.256	1.74	2.48
Hay (tons)	8.72	10.50	12.43	11.12	10.70	11.21
Hops (lb.)[3]	0.32–0.41	0.12–0.39	0.17–0.48	0.23–0.50	0.13–0.30	0.15–0.55
Oats (bus.)	0.313	0.402	0.392	0.438	0.361	0.524
Potatoes (bus.)	0.453	0.541	0.687	0.487	0.616	1.461
Rice (bus.)	0.658	0.796	0.858	0.924	0.906	0.886
Rye (bus.)	0.688	0.718	0.634	0.865	0.839	1.221
Tobacco (lb.)	0.081	0.101	0.128	0.098	0.091	0.147
Wheat (bus.)	0.924	0.986	0.799	0.986	0.92	1.603
LIVE STOCK:[4]						
Cattle:						
Beef[5]	1.70–7.65	2.90–9.50	3.00–10.25	4.85–11.25	4.00–13.60	5.50–13.0
Milch cows	29.21	32.36	45.02	53.94	55.33	53.90
Other cattle	16.32	17.49	26.36	31.13	33.38	33.49
Horses	67.93	95.64	110.77	109.32	103.33	101.60
Mules	78.88	107.84	124.31	123.85	112.36	113.87
Sheep	2.59	3.43	3.94	4.04	4.50	5.17
Swine	6.15	6.55	9.86	10.40	9.87	8.40
LIVE STOCK PRODUCTS:						
Butter (lb.)[6]	0.17½–0.28	0.25–0.37	0.26–0.38	0.24½–0.50	0.24–0.36½	0.39
Eggs (doz.)[7]	0.16–0.47	0.19–0.55	0.20–0.65	0.20–0.62	0.18–0.44	0.44–0.46

[1] Average farm prices Dec. 1. [2] Wholesale prices at Boston. [3] Wholesale prices at New York. [4] Prices per head, Jan. 1. [5] Wholesale prices of inferior to prime beef per 100 lb. at Chicago, for the year. [6] Wholesale prices of extra creamery butter at New York. [7] Wholesale prices of average best fresh eggs at New York.

LIVE STOCK IN THE UNITED STATES, 1905–1916

(*Yearbook of the Department of Agriculture*)
(000 omitted)

	Number Jan. 1, 1905	Number Jan. 1, 1910	Number Jan. 1, 1914	Number Jan. 1, 1915	Number Jan. 1, 1916
MILCH COWS:					
Total, U. S.	17,572	21,801	20,737	21,262	21,988
Illinois	995	1,232	1,017	1,007	1,047
Iowa	1,335	1,570	1,350	1,377	1,391
Michigan	556	936	798	814	847
Minnesota	836	1,125	1,163	1,186	1,210
Missouri	569	925	789	797	837
New York	1,721	1,771	1,465	1,509	1,539
Ohio	790	947	886	895	922
Pennsylvania	1,086	1,140	943	943	971
Texas	838	1,137	1,065	1,086	1,119
Wisconsin	1,095	1,506	1,549	1,626	1,675
OTHER CATTLE:					
Total, U. S.	43,669	47,279	35,855	37,067	39,453
California	1,122	1,120	1,410	1,480	1,554
Illinois	1,666	1,974	1,216	1,180	1,239
Iowa	3,467	3,611	2,555	2,683	2,737
Kansas	2,682	3,260	1,565	1,768	1,945
Minnesota	941	1,228	1,173	1,208	1,232
Missouri	1,490	2,165	1,386	1,414	1,555
Nebraska	2,379	3,040	1,883	2,034	2,237
Oklahoma	1,284	1,637	1,097	1,119	1,186
Texas	8,249	7,131	5,173	5,121	5,428
Wisconsin	1,148	1,081	1,158	1,216	1,313
HORSES:					
Total, U. S.	17,058	21,040	20,962	21,195	21,166
Illinois	1,232	1,655	1,497	1,467	1,452
Indiana	636	847	854	854	854
Iowa	1,144	1,447	1,584	1,600	1,584
Kansas	880	1,187	1,110	1,132	1,109
Missouri	809	1,005	1,095	1,095	1,084
Nebraska	795	1,045	1,048	1,038	1,028
Ohio	785	977	901	910	901
Oklahoma	354	804	766	758	743
Texas	1,277	1,369	1,216	1,192	1,180
MULES:					
Total, U. S.	2,889	4,123	4,449	4,479	4,565
Alabama	161	253	278	281	281
Georgia	201	248	319	309	315
Mississippi	219	299	286	292	292
Tennessee	163	290	270	275	272
Texas	391	702	753	753	768
SHEEP:					
Total, U. S.	45,170	57,216	49,719	49,956	49,162
Arizona	816	1,020	1,601	1,761	1,849
California	2,180	2,372	2,551	2,500	2,450
Colorado	1,458	1,729	1,668	1,751	1,839
Idaho	2,978	4,248	2,981	3,041	3,102
Michigan	1,759	2,151	2,118	2,033	1,931
Missouri	770	957	1,568	1,490	1,416
Montana	5,638	5,747	4,293	4,379	3,941
New Mexico	2,856	4,729	3,036	3,340	3,440
Ohio	2,601	3,203	3,263	3,263	3,067
Oregon	2,546	2,581	2,670	2,563	2,563
Texas	1,617	1,909	2,052	2,114	2,156
Utah	2,344	3,177	1,970	2,068	2,089
Wyoming	3,267	7,316	4,472	4,427	4,338
SWINE:					
Total, U. S.	47,321	47,782	58,933	64,618	68,047
Georgia	1,396	1,647	1,945	2,042	2,348
Illinois	3,747	3,772	4,358	4,358	4,489
Indiana	2,631	2,578	3,969	4,167	4,167
Iowa	7,290	6,485	6,976	8,720	9,069
Kansas	1,949	1,942	2,350	2,656	2,815
Missouri	3,110	2,714	4,250	4,250	4,505
Nebraska	2,888	3,201	3,228	3,809	4,266
Ohio	2,701	2,047	3,467	3,640	3,713
Texas	2,525	3,205	2,618	2,880	3,197
Wisconsin	1,653	1,651	2,050	2,225	2,142

AGRICULTURAL STATISTICS FROM CENSUS OF 1910

(*Yearbook of the Department of Agriculture*)

	Total	Percentage
Land area (acres)	1,903,290,000	
Farms (acres)	878,798,000	46.2
Improved (acres)	478,452,000	54.5
Woodland (acres)	190,866,000	21.7
Other unimproved (acres)	209,481,000	23.8
Number of farms	6,361,502	
Average area per farm (acres)	138.1	
Average area of improved land per farm (acres)	75.2	
Farms under 20 acres		13.2
Farms of 20 to 99 acres		44.8
Farms of 100 to 499 acres		39.2
Farms of 500 to 1,000 acres and over		2.8
Value of crops of Continental U. S	$5,487,161,223	
Value of all farm property, and per cent. increase	$40,991,450,000	200.5
Value of land	$28,475,674,000	218.1
Value of buildings	$6,325,452,000	177.8
Value of implements and machinery	$1,265,150,000	168.7
Value of animals, poultry and bees	$4,925,173,000	160.1
Value of all property represented in—		
Lands		69.5
Buildings		15.4
Implements and machinery		3.0
Animals, poultry and bees		12.0
Average value per farm of—		
All property	$6,444	
Lands and buildings only	$5,471	
Average value of land per acre	$32.40	
FARM EXPENSES		
Labor:		
Farms reporting	2,922,288	
Per cent. of all farms		45.9
Cash expended	$521,727,000	
Rent and board furnished	$129,878,000	
Feed:		
Farms reporting	2,368,905	
Per cent. of all farms		37.2
Amount expended	$299,839,000	
Fertilizer:		
Farms reporting	1,823,032	
Per cent. of all farms		28.7
Amount expended	$114,884,000	
NATIVITY OF FARM OPERATORS		
Number of farms operated by—		
Native white	4,771,063	
Foreign white	669,556	
Negro and other non-white	920,883	
Percentage of operators who own their farm among—		
Native white		66.3
Foreign white		81.4
Negro and other non-white		26.2

XVIII. THE MINERAL INDUSTRIES

MINING AND ORE DRESSING

CHARLES E. LOCKE

The Mining Industry.—The year 1916 will go down in history as one of great prosperity for the mining industry in the United States, due primarily to the demands of the European War. Prices have made new high records, and hence operating mines have been worked to full capacity, old mines have been reopened, and search for new mines has been stimulated. For example, copper has ranged between 25 and 33 cents per pound against a normal price of 12 cents; silver, 55 to 77 cents per ounce, normal, 55 cents; lead, 5.5 to 8 cents per pound, normal, 4 to 4.5 cents; zinc, 9 to 18 cents, normal, 5 cents; antimony, 12 to 45 cents, normal, 8 cents; quicksilver, $80 to $300 per 75 pounds, normal, $45; pig iron, $30 per ton, normal, $15; tin, 40 to 50 cents per pound, normal, 35 to 40 cents. Some metals, such as antimony, quicksilver and tungsten, reached their very high prices during the first half of the year and dropped back during the last half. (See also other articles in this department; and XIII, *Economic Conditions.*)

Lake Superior iron-ore shipments to Oct. 1 were a record at 48,816,650 tons, an increase of 14,147,084 tons over the same period in 1915, indicating an estimated tonnage of 62,000,000 for the entire year. Copper reached the highest price in 40 years and the fact that much copper has been sold ahead into 1917 assures a continued high price. Lack of refinery capacity has prevented any accumulation of a surplus of this metal. In the case of lead ores, the Utah smelters had to refuse some offerings of ore and thus reduced production. Old graphite and manganese mines in the South have received attention and have been started up again and worked profitably. The tremendous activity is exampled by the production of 40,000 tons of ore per day by one mine, the Utah Copper. With operators straining to increase production under the stimulus of high prices, it still seemed impossible to meet the demands. Pig iron was scarce even though the production is at the rate of 40 million tons per year. The shortage of coal, especially anthracite, became somewhat serious toward the end of the year.

Increased dividends have resulted and profits have been shared almost universally with the workmen, either in the form of increased wages or bonuses. The sliding wage scale, based on the selling price of the product, has been perhaps the most satisfactory arrangement. In spite of all this, labor has not been satisfied. Three serious strikes have occurred: in the Clifton-Morenci district of Arizona, in the Mesabi iron region of Minnesota, and at Youngstown, Ohio; other minor disturbances have taken place elsewhere. Practically all may be attributed to agitators, and have ended in partial or entire defeat for the strikers (see also XVI, *Labor*). In spite of increased wages, there has been a shortage of labor in many districts. This, coupled with higher costs of material and decreased efficiency of labor, has prevented profits from keeping pace with increased price of product. As an example of increased cost of supplies, dynamite may be taken. There is a shortage of glycerine and an increased demand for it for war use. The price of straight nitroglycerin and gelatin dynamites has made them almost prohibitive to the miner, who has had to be satisfied with the ammonia compounds.

Considering developments in individual sections, the Oatman gold field in Arizona has progressed satisfacto-

rily and gives promise of being a big low-grade camp. A new gold district is reported at Gold Lake, Manitoba, but it is too early to decide regarding its value. Similarly, big nickel-platinum deposits are reported in northwest Canada up toward the Arctic Circle. Butte, after many years as a copper center, is developing a big zinc industry. Lake Superior every year develops new copper mines, and shows evidence that even after 50 years of work the ground has hardly been scratched. The Calumet and Hecla Co. had a big celebration of its semi-centenary during the year, and there appears to be no reason why it should not be working 50 years hence. The southeast Missouri lead district is expanding beyond the limits of St. François County into Washington County. Alaska may be said to be progressing slowly. In August the first train of coal from the Matanuska coal fields came out over the new government railroad. The Alaska Gold Mines Co. has not come up to the promise of its promoters, but it is expected that ultimately it will reach a profitable stage (see also VIII, *Alaska*). The Anaconda Copper Co. of Montana has followed the lead of other large interests in acquiring large copper deposits in Chile. In Mexico alone has there been no progress and most of the mines have been idle owing to unsettled conditions.

The "safety-first" movement is to be credited with still further decrease in accidents and fatalities. Agitation for revision of the United States mining law still continues, but it is opposed by the slowness of Congress to take action. A bill to appoint a commission to report a revision of the law passed the Senate but died in the House Committee on Mines.

Mining Methods.—Regarding improvements in mining it is always true that a boom period is not the time of greatest progress, since the operators are too busy making money to attend to all the economies of operation. Large steam shovels up to eight cubic yards capacity and lifting material up to a height of 65 ft. are used on coal mines, and under special conditions, in iron mines. The boom is as long as 90 ft. and the whole shovel revolves instead of the boom alone. Stripping of overburden by hydraulicking instead of by the usual steam shovel method has been used at the Hillcrest iron mine in Minnesota. The Inspiration automatic hoist at Miami, Ariz., is reported to be a perfect success. Hammer drills are finding a larger field, notably in sinking large shafts at Ironwood, Mich. (Woodbury shaft), and elsewhere. Compressed-air locomotives for underground haulage have replaced electric trolley in one or two instances, solely for reasons of safety.

Ore Dressing.—In ore-dressing, flotation still continues to be the sensation, although yet undergoing the difficulties of litigation. In the latter part of the year, the Minerals Separation Co. won their case against Miami in the District Court of Delaware, this being directly opposite to their previous defeat in the suit against Hyde in California (*A. Y. B.*, 1914, p. 492). The U. S. Supreme Court, however, at the end of the year reversed the Hyde decision and gave a decision in favor of the Minerals Separation Co. Figures for 1916 without question will show a great increase over the 1915 total of over three million tons of ore treated by flotation. The process is still rule of thumb, although much investigation has been made during the year, seeking knowledge of the fundamental principles.

Flotation has turned attention largely away from leaching for copper sulphide ores and has an advantage over cyaniding on silver sulphide ores, both in cost of plant and in cost of operation. On copper oxide ores it still has a rival in leaching, as evidenced by the new leaching plants of the Inspiration and New Cornelia companies in Arizona, and the Utah Copper Co. in Utah. On Lake Superior native-copper ores it seems destined to play a big rôle in increasing the saving. Broken Hill, Australia, may still be said to be the home of flotation and its modifications along the line of preferential flotation. There, the Bradford, Owens, Lyster, Palmer, Horwood, old DeBavay film, and various adaptations of the Minerals Separation process are in use at various properties. (See also other articles in this department.)

COAL, COKE AND PETROLEUM

R. Dawson Hall

Coal Mining.—For many years the steam shovel has been used in the anthracite region for the uncovering of coal, the thickness of the deposit and its relatively high price in the market making the removing of several feet of soil feasible. In the bituminous region, where the shovel is now making great progress, the seams are thinner and the coal of less value. The maximum depth of the deposit workable by shovel, of course, is limited, but in cases where the coal is available for stripping, the spoil need not be loaded into cars. All that is necessary is to lift it with a shovel having a long boom and drop it in some other place, from which coal has already been excavated or in which coal was not to be found. The work is heavy, its character is uniform, and consequently the shovel needs to be and can be fitted to the job. There is no problem connected with continuous change of location as in railroad construction, where the work of moving, the uncertainty of operation, the variation in material to be moved and the limitations of rolling stock make the construction of large shovels somewhat undesirable. As a result the stripping shovel is developing features of its own, the shovel itself holding as much as 8 yds. and the boom being of great length. Wonderful results are being obtained, the low cost of mining by this method having a demoralizing effect on the old-fashioned mines. The mine workers and the owners of underground mines do not favor the innovation, and the public in the strip area denounces freely a system of mining which leaves the ground unfit for farming or any other purpose. In Illinois the depth of cover averages 3.86 times the coal thickness; in Oklahoma it is 10 times the thickness of the coal uncovered, the coal averaging only 22 ins. The greatest thickness of cover removed is 26 ft. Stripping is being performed also in places by drag scrapers, in another place by a drag line excavator, and in still another, part of the surface is hydraulicked. In one place an apron conveyor takes the waste to a spoil bank.

Some progress has been made in the introduction of revolving dumps such as are in universal use in England. There one car is dumped at a time. The Ramsey dump in revolving unloads several at one operation. At the Lemont No. 2 plant of the H. C. Frick Coal Co. 18 1½ ton cars are reversed at one time.

The electric cap lamp is making satisfactory progress. It appears to have only one fault, it will not indicate gas. Though it is perfectly safe, it fails to show the presence of danger, and gas may then be ignited by a spark from a pick, the flare of an explosive, an arc at an imperfect contact of two electrically connected surfaces, or by some other means. The acetylene safety lamp is almost inevitably heavier than the naphtha lamp and hitherto has been regarded as anything but safe. When a blast or a jar extinguishes the lamp, unlike the naphtha lamp it fills with an explosive gas of its own making. The relighting of a naphtha lamp is dangerous in a gaseous atmosphere even with an internal igniter because of the fact that the internal explosion may pass the gauze. The explosion of an acetylene lamp is more violent and hotter and therefore far more dangerous than that of a naphtha lamp, and the escaping acetylene may give the methanized atmosphere outside a power of receiving flame it would not otherwise have. In the T. M. Chance lamp it is thought with much reason that this risk is removed. The burner is double and between the flames is a piece of alloy which becomes white hot. Should the flames be extinguished they are instantaneously relighted by the incandescent alloy long before the gas within and around the gauze can become impregnated with the explosive gas, generated by the lamp, and before the gauze can be filled with an explosive atmosphere from without.

A new cap lamp has made its appearance which has a bulb with two sockets and a straight tungsten filament. The filament runs tangentially to the head of the miner and the bulb is seen lying athwart his cap instead

of standing out from it. Some acetylene mine lamps are being made with the flame passing obliquely across the reflector instead of at right angles to its optical axis. This gives better illumination and a straighter and more easily cleaned passage for the gas, which is apt always to carry dust and so tends to clog the burner.

Mine Rating for Compensation Insurance.—In Pennsylvania the new workmen's Compensation Act went into effect on Jan. 1. Several large insurance companies banded together to take this somewhat hazardous form of insurance in common. They provided for an elaborate system of mine rating somewhat similar to that adopted in the determining of fire hazards for insurance purposes. The companies instituted a careful system of inspection so as to make the rating equitable. In this system the state coöperated by engaging the inspectors appointed by the private corporations. Thus the rating basis was made uniform. The basing of rates on the hazards of the mine has produced the same effect as the rating of fire insurance on the basis of fire risk, and large sums have been expended accordingly in improving the physical condition of the Pennsylvania mines. The workmen's-compensation insurance in West Virginia is now based on past records of each mine instead of being made a uniform charge on all the coal mines in the state.

Gasoline.—The demand for gasoline has caused the producers of natural gas to develop to large dimensions the production of what is known as casing-head gasoline, which is made by the process of compressing and condensing the liquefiable constituents of "wet" gas. At many plants the product is stabilized by the use of naphtha. Despite the large quantity of gasoline obtained by distillation and fractionization of oil and from gas at the casing head, the demand is by no means equal to the supply, and it is believed that another important source, about five per cent. of the present output, will be found in the absorption of gasoline from so called dry gas, the absorbent being a current of naphtha. The naphtha thus enriched is then sold. Other oils heavier than gasoline may be used instead of naphtha and the gasoline recovered by distillation. Gases containing less than three-quarters of a gallon per 1,000 cu. ft. can be utilized for the production of gasoline. The average gasoline production secured from 1,000 cu. ft. of the gas hitherto used for that purpose has been 2.43 gals. The dry-gas product will be much less per 1,000 cu. ft. but the great volume of the consumed gas now untreated (in 1914 35 times the volume of the gas subjected to treatment) suggests the possibilities of the new method. C. A. Burrell, P. M. Biddison and G. G. Oberfell have discussed this recent development in gasoline recovery before the Natural Gas Association of America.

As to the Rittman process, it was reported in May that 20 factories were licensed to use the method. By this process gasoline can be produced at a cost of 12.8 cents per gallon from a fuel oil which sells at $2.10 per barrel with the gasoline removed. Using a fuel oil costing 50 cents per barrel the cost of gasoline will be 6.9 cents per gallon. These figures are the result of an official test lasting five days.

Petroleum.—The plan of strengthening the flow from producing oil wells by flooding non-productive holes with water or putting them under air pressure is being put to some use. In West Virginia a suit has been brought against an oil company which attempted to increase its output by the latter method. The plaintiff declares that the air enters the casing-head gas and so lowers the gasoline production of the well. The law requires that fresh water must be cased off in wells and also when they are abandoned they must be plugged in order to keep water out of the sand, but apparently there is no provision to keep the producer from deliberately flooding his well.

The gasoline content of the Cushing oil is decreasing as the field grows old. Among important new developments are the Shamrock field in Oklahoma and the Augusta field in Kansas. Another interesting field is that at Graybull, Wyo., where the wells are shallow and the product rich in gasoline and kerosene. Their output is not large but enough to make operation profitable.

IRON AND STEEL

J. E. Johnson, Jr.

Commercial Conditions.—The iron and steel industry in 1916 has been characterized more by commercial activity than by technical advance. The demand for steel has been so great and the prices to which steel products have been forced so high, that all the energies of the steel-mill staffs have been directed to production rather than to making new advances. The fluctuating nature of the steel industry puts it at a disadvantage in certain respects. In dull times the staff must be reduced and even then, in periods of great depression, becomes an undue burden on manufacturing cost. When prosperity revives, which it generally does with great suddenness, it is impossible to augment the staff in proportion to the increased duty thrown upon it and the energies which in normal times are expended upon betterments of processes or improvements to the quality of product, are all directed to getting out tonnage. The scientific side of the steel business receives during such periods only the attention necessary to insure good quality. (See also XIII, *Economic Conditions;* and XIX, *Manufactures.*)

Ore Treatment.—In regard to iron ore there have been no developments of note. The appreciation of concentration is growing, especially of metamorphic rocks containing iron in magnetic form but in quantities far too small to permit calling them "ore." It will probably continue to grow for a long time to come and will have an effect of no small importance in prolonging the life of the world's ore supplies and deferring the day when very lean material may have to be put through the furnace without concentration. The washing of the lean ores on the western Mesabi is another development of importance. Certain ores in the East and South have been washed for two generations, generally for the removal of clay, but on the eastern Mesabi a large part of the problem is the removal of sand, so that the methods developed for the older districts only afforded part of the solution in Minnesota. The sintering of iron ores, both to agglomerate those too fine for immediate use in the blast furnace and those high in sulphur, continues to grow at a healthy rate.

By-product Coke Ovens.—No technical advances of importance have been made in by-product coke ovens for a year or two past, but purely commercial reasons have brought about the introduction of this oven in 1916 at a rate two or three times as rapid as ever before, so rapid in fact that the handwriting is on the wall for the complete elimination of the beehive oven as a factor of any importance in producing blast-furnace fuel. The principal cause which has brought this about has been the enormous value of all the chemical by-products recovered from these ovens, but especially of benzol and toluol, used for the making of picric acid and trinitrotoluol respectively, these being the explosives used in high-explosive shells. The value of these compounds with that of the sulphate of ammonia and tar recovered has gone far to pay for both the coal and the cost of coking it under the conditions existing during the year, and has left the net cost of the coke almost nothing. Plants are now under way for converting these materials into medicines, dyes and other products, and we may reasonably hope that benzol and toluol will never again be almost waste products in the coking industry of this country as they were at one time. (See also XXIV, *Industrial Chemistry.*)

The Blast Furnace.—The only new development at the blast furnace during the year also has been a result of the situation brought about by the war. It has been found that the amount of potash in the blast-furnace charge was frequently larger than had been suspected, that a large part of this is volatilized through the heat in the hearth, and passes out of the stack as a part of the fume which makes the gas of normal working blast furnaces white. It has been further found that the dust which settles out in the bases of the hot-blast stoves and other points of deposition contains very substantial quan-

tities of soluble potash. This dust accordingly has been collected at several plants and sold at a good price, owing to the dearth of German potash. It has been found further that potash has an objectionable influence in fluxing away the brick of the stoves, and its removal from the blast-furnace gas, when it is present in large quantities, becomes particularly desirable on this account. Further developments along this line may reasonably be expected.

There has been a steady development of the hot-blast stove consequent upon the general introduction of cleaned gas, which has eliminated the worst difficulties to which stoves were subject in days gone by. This has permitted the use of smaller checker work and thinner brick, so that the heating surface in a stove of a given size has been enormously increased. This with better methods of combustion, consisting of more accurate proportioning of the air and gas and their more intimate mixture, has resulted in greatly increasing the efficiency of the stoves. The efficiency of the stoves has been raised further by the use of insulating material of a much higher order than fire brick between the brick work and the shell. This material is kieselguhr or of that general nature. Boilers also have profited by the same improvements in combustion that have been responsible for the increased efficiency of stoves. Boiler efficiencies have gone up correspondingly and this has had the effect of diminishing the lead of the gas engine over the steam engine in regard to heat consumption.

The filling of the blast furnace, perhaps the most important single feature of the whole blast-furnace operation, has been more or less neglected for the past 15 years, though always seriously considered by the best informed furnacemen. During the year this subject has received much more attention, and one new step of considerable importance has been taken, the introduction of the Slick saw-tooth distributor, which breaks up the flat layers of stock and gives them a columnar structure of alternate coarse and fine. Excellent results are claimed for this and it is probable that the claims are well founded.

Steel Making.—In the conversion of iron into steel one of the most important recent developments has been the attention paid to the open-hearth furnace. Powdered coal, which has been known as a fuel for a long time, has now been applied very successfully to the heating of the open-hearth furnace. Certain precautions are necessary to prevent the fine ash from filling up the checkers and care is needed to see that the coal is properly prepared and safely stored. When proper precautions are taken in these respects, powdered coal becomes a successful and economical fuel for the open-hearth. The radiant heat evolved by the luminous particles of carbon gives it an advantage over non-luminous gaseous fuel. The money cost of pulverizing is no greater than that of gasifying in the gas producer, and the pulverized fuel contains all the heat of the coal, while the gas only contains about three-quarters. Satisfactory methods for burning the coal have already been developed but those best informed believe that still better methods will be found eventually.

The open-hearth is an exceedingly inefficient apparatus thermally, less than 10 per cent. of the heat of the coal being imparted to the bath. This is due to the very high temperature at which this apparatus must work. It is impossible for the regenerators to save more than a small fraction of the outgoing heat, and the consequence is that much valuable heat goes up the stack. To meet this situation in very recent time, waste-heat boilers have been installed between the regenerators and the stack. It was impossible to say in advance whether the steam obtained would pay the fixed charges on the installation, but now this has been definitely and positively ascertained and the use of such boilers is increasing. In this way the overall efficiency of the open-hearth furnace is materially increased and this practice is sure to grow.

The duplex process of producing steel continues to grow in favor. It will not be surprising if in the next few years the largest proportion of the steel made is produced by this process, although for special pur-

poses the Bessemer and open-hearth processes will probably continue to be used for many years to come. The last year or two has seen an important development in triplex processes, in which the steel is treated in three vessels instead of two as in the duplex. Sometimes the three are a Bessemer converter and two open-hearths, using different kinds of slags, or in other cases a Bessemer, and open-hearth and an electric furnace for refining. By the use of the former, the phosphorus in the pig iron at the largest plant in the country where high-phosphorous pig iron is used, is concentrated into a small proportion of the total slag, with the result that this slag is about as rich in phosphorus as the "Thomas slag" of Germany. Thus a valuable by-product is recovered.

The method of casting ingots continues to attract much attention. The process of casting big end up is making headway on account of the reduced length of "pipe" produced thereby, and this method of casting is destined to grow in spite of the greater difficulties of stripping when it is used.

In steel rolling no radical innovations have occurred. The electrically driven reversing blooming mill continues to make headway in spite of its high cost.

Special Steels.—The electric furnace has made rapid strides in 1916, not only in the large sizes for refining heavy charges as in triplexing, but also in smaller sizes for the production of castings and especially of alloy steels, which likewise have experienced a tremendous growth. It is not generally realized what a large tonnage of these special steels is used. They find their particular application in the automobile on account of its requirements of light weight and great ability to resist shock. Some of the recent alloy steels, particularly those containing vanadium, chromium and nickel, either singly or in combination, have not only great strength but wonderful resistance to shock and repeated stresses. Vanadium, which was a rare metal a few years ago, has become a recognized necessity in the production of many of these steels. The automobile is making itself felt more and more as a consumer of iron and steel. The largest manufacturer is now building two blast furnaces, the iron from which is to be converted directly into castings for automobiles and tractors.

Tool steel has had a career more spectacular even than that of steel for construction purposes during the year, probably on account of the enormous requirements of tools for the production of shells. As a result, some of the alloys used in the production of this steel have skyrocketed; tungsten in particular went to unheard-of prices, though sufficient supplies of the ore were found eventually to break the market, and after several months the stick of the skyrocket returned to earth.

Uranium is a new element just making its way among the alloys used for "high-speed" tool steel. If the claims made for it can be substantiated, tool steel, which has undergone at least one revolution in the last 16 years, seems likely soon to undergo another.

COPPER

L. S. Austin

Mining and Metallurgical Methods.—The year has been marked by increasing attention to cheaper mining methods, lower extraction costs and higher recoveries in working large bodies of low-grade ores. Larger reverberatories, electrostatic methods of dust precipitation, and flotation methods are fully in use. To treat the great tonnages of leaner ores, large capital expenditure in the construction of power plants, ore-dressing works and reduction works has been justified.

By flotation methods it has become possible to dress cheaply lean copper ore of one to two per cent. copper with a 90 per cent. recovery of concentrate. Whether flotation or water concentration is to be used depends upon the ratio of concentration. Thus, at the Inspiration mill in Arizona the ratio is high and flotation is the major process, gravity dressing supple-

menting it; at Clifton, in the same state, where the ratio is low, water concentration prevails, with flotation supplementary. The latter condition prevails at Anaconda likewise. Even when the ratio is as 10 or 12 to one, water dressing may come in as the major process.

In shaft mining the improvements have been due to the methods of shrinkage stoping, the use of light one-man machine drills (which have nearly doubled the output per man), the sorting of ore underground, the chuting to skips from tipples placed in the drifts, the extensive use of waste for back-filling, and development work by the drills above mentioned.

Production and Exploitation.—Copper refinery production in the United States in May was 190,000,000 lb. for the month; this had dropped to 150,000,000 lb. monthly by midsummer, but late in the year the output had increased to 165,000,000 lb., equivalent to two billion pounds or one million short tons annually. Little or no unsold copper has been carried during the year; in fact, production has been sold several months ahead. A recent contract for the sale of 200,000 long tons (448,000,000 lb.) to Great Britain and her allies means a profit of $70,000,000 in 1917. The price for the year has been maintained above 25 cents per pound for electrolytic copper.

Labor troubles in Arizona in the latter part of 1915 have been settled, so that the output of that state is at its maximum. The fuller introduction of machinery has cut the number of laborers to the lowest point, and those remaining are better contented, due to the higher pay of the skilled workmen.

As the copper mines of the Caucasus are in the war zone, Russia has been largely increasing its output. Due to political conditions, production in Mexico still continues insignificant. In Chili the Braden Copper Co. has been treating 4,500 tons of ore daily. The plant of the Chili Exploration Co. at Chuquicamata is now fully in operation as respects its first unit of 10,000 tons daily capacity. Mining is done by steam shovel and the treatment consists in crushing to one-half-in. size, leaching with sulphuric acid, and precipitating the resultant solution electrolytically. At the Potrerillos mines upwards of 60,000,000 tons of ore of profitable grade have been developed by churn drilling. In addition there is 200,000,000 tons of ore of lower grade that can be worked at a profit.

In Alaska the Kennecott mines have been producing ore at a cost of approximately five cents per pound of copper. At the Jumbo mine, on the 500-ft. level, ore of 70 per cent. copper has been developed in quantity, though the larger part of the output has been dressed in an 800-ton concentrator.

In Arizona the Inspiration Copper Co. and the associated works of the International Smelting Co. have attained to full production; while at Clarkdale the new smelting plant of the United Verde Copper Co. is treating not only its own ores but much custom ore from the northern part of the state. The Copper-Queen property has been building a plant for the flotation treatment of its disseminated and aluminous ores. Thus, throughout the state successful methods, with the liberal investment of capital, have been employed in the treatment of ores formerly considered too low for profitable extraction, and this too in spite of high prices for operating labor. To attain high recoveries, fine grinding is necessary, so that the power consumption is large, and cheap power must be had. This has been attained by the adoption of the steam turbine in as large units as 7,500 kw. for the generation of electric current and its distribution not only to the mill but also to the mine and the smeltery. The Diesel oil engine also, burning a California asphaltum crude petroleum, has proved economical in the production of power.

The Ray Consolidated has adopted the shrinkage system of mining, the extraction drifts being placed 100 ft. apart with an inclined raise and a simplified system of tramming. The output of the mine, 7,000 tons early in the year, has been increased to meet the enlarged demands of the concentrating mill.

The New Cornelia Copper Co. has

been erecting a 4,000-ton leaching plant at Ajo, Ariz., for the treatment of a large tonnage of carbonate and silicate ores of about 1.5 per cent. copper, which may be mined by steam shovel. The ore is crushed to 4-mesh size and leached with sulphuric acid by upward percolation in tanks against a 10 to 12 ft. depth of ore. The resultant solution is treated electrolytically, hard lead anodes being used. To keep the ferric iron under control, sulphurous acid is added to the circulating solution in absorption towers.

The Utah Copper Co. has increased its output to 48,000 tons daily, though its normal milling capacity is but 20,000 tons. This it has done by crowding its mills, but with a consequently lower extraction. It has been impelled to do this in order to take advantage of the present high price of copper. The company is building a leaching plant to take care of its oxidized surface ores. To furnish cheap sulphuric acid for this leaching and for other purposes, an acid plant has been erected by the American Smelting & Refining Co. at its Garfield smeltery.

The Anaconda Copper Mining Co. has enjoyed a highly prosperous year, due not only to the increasing size and value of its ore bodies but to higher recoveries and increased tonnage treated at Anaconda. Heavy additions to the concentrating and smelting plant aggregating $6,000,000 were completed and put into operation towards the end of 1915, and these are now fully in operation, thus greatly reducing costs. Particularly mention should be made of the eight new reverberatory furnaces of 23 by 143 ft. hearth dimensions, which smelt 650 tons each per day; also the five 20-ft. Great-Falls type converters which produce 24,000,000 lb. of copper monthly and reduce operating costs $1 per ton. The large furnace built to treat converter slag reduces daily costs by about $500. To meet the increased output a new refining plant went into operation in March. It is of the capacity of 100,000,000 lb. annually and the cost of refining has been reduced to $3 less than that at the old Great Falls refinery. As a result of improvements introduced in 1915, the company has been able to add to its annual output 55,000,000 lb. of copper without increasing tonnage or grade of ore mined. Of this, 40,000,000 lb. is made without adding to the cost per ton of ore treated, due to the adoption of concentration by the flotation process. The increased cost of this operation is offset by the decreased smelting cost.

The mines of the copper country of Michigan have had a year of great activity. Wages have been high, accompanying the high price of the metal. Contract work and the bonus system have been introduced, resulting in the doubling of output per miner. This increased efficiency shows itself in reduced costs, so that large tonnages of low-grade ore, formerly left in the stopes, are now extracted and milled at a profit. The use of the light machine drill and the Carr bit also has increased efficiency.

GOLD AND SILVER

HERBERT A. MEGRAW

General Conditions.—The production of gold and silver in 1916 has been governed by a combination of circumstances all of which have depended, either directly or indirectly, upon the political situation in Europe. Gold mining naturally has been prosecuted with the utmost vigor. This was to be expected, since the demand for gold by all nations has been great in order to liquidate constantly increasing indebtedness. All the producing gold mines have been worked at their greatest capacity and even some new ones have been opened and developed.

With silver, on the contrary, the situation has been somewhat different. Towards the latter part of 1915 there was a depression in the silver market which was gradually lifted by increasing demand, so that near the end of the year the price had risen above 50 cents per ounce, and at the beginning of 1916 the price was about at normal. The average price of silver in January, 1916, was 56.775 cents per ounce, compared with 48.855

cents in 1915 and 56.572 cents in 1914. It will be seen that the price in January, 1916, was about equal to the normal in 1914. The monthly averages in February and March were 56.755 and 57.935 cents, respectively, showing a slight tendency to advance. In April, however, there began a decided and strong demand for increasing quantities of silver, so that in April the average price was 64.415 cents per ounce, and in May the increasing demand forced the average price for the month up to 74.269 cents per ounce. The highest single price quoted during that month was over 76 cents per ounce. During the latter part of the year silver again advanced in price, and in November and December reached the high levels of the early part of the year. On Dec. 20 the quotation for silver reached 76⅝ cents.

The demand for silver came partly from those countries whose hoard had been drawn upon for war expenses or for unusual expenses created indirectly because of the war, such as occurred in India and China. Another part of the demand, however, came from belligerent countries whose stock of gold had become somewhat depleted or who desired to retain what gold they had and replace current coinage with silver. Naturally, a demand of this kind created a great deal of interest in silver mining, and the production was strongly stimulated. The price of silver continued high throughout the rest of the year, and in December, as noted above, surpassed the highest level reached in May.

Gold Production.—In 1915 the total gold production of the world amounted to about $470,979,890, while that of the United States, including Porto Rico and the Philippines, amounted to $98,891,100. The 1915 figures for gold show an increased production of somewhat more than $19,000,000 over that of 1914, and about $8,300,000 over that of 1913. The four leaders among the gold producing countries retained their respective ranks and were, as for a number of years past, the Transvaal, the United States, Australia and Russia. The Transvaal produced about 40 per cent. of the world's total, and the United States about 21 per cent., a little over nine per cent. coming from Australasia, and about six per cent. from Russia, so that these four countries supplied about three-quarters of the world's supply.

Gold Mining and Metallurgy.—No new gold-mining field has been discovered during the year 1916, but, as has already been said, most of the existing mines have been worked at maximum capacity. In gold metallurgy there has also been a lack of startling developments, progress having taken place along the lines of slow, steady, continuous and thoroughly justified developments. The flotation process has continued to be applied increasingly to metals containing gold, but it is to be noted that as yet the process has not been adapted to ores in which the value is exclusively in gold, but rather to ores in which, while gold occurs, it is not the major metal sought. Examples of such practice may be found in the large porphyry copper districts of the Southwest, where some gold is present with the copper, and also in the copper mines of Montana. Gold occurs also to a small extent in some of the Colorado lead-silver ores, and at least in one mine the flotation process has been applied with highly successful results to the recovery of gold along with other metals.

It is noteworthy that the Dome mine, South Porcupine, Ont., has increased its output, enlarging its mill by supplanting the stamps with conical ball mills. Placer mining has prospered through the year, most of the California deposits having been worked continuously, the same applying to those in Alaska and to those that are worked in South America. At the present time the hope for new discoveries in gold is centered almost entirely in the vast areas of South American territory which up to this time have not been very highly prospected.

Silver Production.—The silver production of the United States in 1915 showed a decline of nearly seven per cent. over that of the preceding year. This is noteworthy, since it is the first decline shown for a number of years. The production amounted to about 67,500,000 fine ounces. In view

of the political causes already mentioned, however, it is to be expected that the silver yield of the United States during 1916 will be considerably larger than that of the preceding year. The demand for the metal and its high price has stimulated activity, and silver mines are being worked as hard as possible. The Ontario silver districts, such as Cobalt, are being worked at their maximum capacity. While production from Cobalt has fallen off materially from its record year, nevertheless the production is still large and is a factor to be counted upon. Silver also occurs and is produced in the United States very largely as a by-product, large amounts being produced in the Montana copper and zinc districts and also in the Cœur d'Alene district of Idaho as a by-product of the lead and zinc mines. Silver production and price probably have been largely influenced by the condition in Mexico, where revolutionary disturbances have continued, as during the last few years, and have made it impossible for silver to be produced upon a large scale. Since Mexico is normally the largest silver-producing country in the world, its practical retirement from the field is a factor of considerable importance.

Silver Mining and Metallurgy.—There have been no new silver camps discovered during the year, and there is little hope that new ones will be found soon, at least in the United States. It is always possible that further extensions of silver-producing territory may be opened in Canada, and it is probable that South America will continue to increase her silver supply for some time. New camps, or districts in which the metal may be obtained, are expected to be opened up from time to time.

Metallurgical progress in silver has been, like that in gold, largely a question of steady development. There have been no noteworthy discoveries and the continual widening of the field for the flotation process has been the feature. The cyanide process is still largely responsible for the silver production of this hemisphere, but it is probable that its use will be more and more restricted as flotation is developed and applied to take its place. It is highly unlikely, however, that the cyanide process will be entirely displaced, since it will probably be used as an auxiliary, possibly to recover bullion from concentrates produced by flotation. Particularly those plants situated in isolated districts will be glad to make use of a combination of the flotation and cyanide processes.

Some of the Mexican mines have been able to continue operation and production in some sort of a way, and notable among these is the Santa Gertrudis, situated at Pachuca. This mine has been able to operate part of the time, and has carried on considerable experimental work. One of the most enlightening features of this experimental work is said to have been a trial of flotation upon the ores. In an article submitted to the American Institute of Mining Engineers, Hugh Rose, manager for the company, conveys the impression that under normal conditions it may be possible and advantageous to apply flotation to the bulk of the Santa Gertrudis ores, finding some advantage in the low cost of the process. This is not a certainty, but a possibility. It is not intended to convey the impression, however, that cyaniding will be entirely displaced, since it will probably always find a use in treating ores of this particular kind.

Crushing and Grinding.—There has been some disposition to impróve the use of crushing and grinding machinery in both gold and silver metallurgy. The displacement of stamps as primary crushers has continued in the same way as in former years, and now ball mills of different kinds are being largely employed in their place. Crushing is now being continued on the straight-line process, that is, making use of crushers of various capacities, starting with the largest and continuing through successively smaller ones until the ore has reached the degree of comminution desired. A feature of modern crushing practice, at least in some of the new and larger plants, is that passage through the process is once only, the oversize not being returned to the same machine for recrushing, but being sent forward to other crushers installed for that particular purpose.

LEAD

H. O. Hofman

Smelting.—A general review of modern lead-smelting practice has been prepared by Arthur S. Dwight (*Eng. & Min. Jour.*, 1916, c i i, 671). Two factors have influenced recent progress in smelting, first, preparation of the furnace charge, including roasting and agglomerating, and second, the more efficient mixing and distribution of the charge. A modern lead blast furnace is rectangular in cross section. The inside dimensions at the tuyères have usually, width, 42 to 44 in., and length, up to 18 ft. The charge column is 14 to 18 ft. high. The height of water jackets has been extended gradually until now they frequently reach nearly to the charging floor. The furnaces universally use the Arents siphon tap and a water-jacketed slag tap.

Roasting processes for treating sulphide ores in preparation for the blast furnace must furnish a coarse product low in sulphur. This result is usually best obtained by first treating in a mechanically rabbled hearth to reduce the sulphur to 16 or 18 per cent. and then finishing in Huntington Heberlein pots or Dwight-Lloyd sintering machines. The Godfrey roaster, which for a long time was standard for this preliminary work, is now giving way to the Wedge furnace, which is proving more satisfactory. In some cases a pre-roasting has been carried out on a Dwight-Lloyd machine and the finishing roast and sintering performed in a Huntington-Heberlein pot. If any sinter is produced in the first roast, it must be crushed to small size before the final roast. This method will reduce the sulphur to 2.5 per cent. Some plants have found it profitable to overburden the sintering machine and return the unsintered part to the charging bins. This partly roasted material is an aid in the treatment of the ore.

The Dwight-Lloyd company has developed a charging system for their machines which is highly satisfactory for fine materials. A belt forms the bottom of the hopper bins and by regulating the speed of the belt and the height of the discharge gate, a definite amount of ore can be delivered onto the main charging belt which passes in front of the row of bins. In this way the charge can be accurately proportioned.

The matter of smelting galena concentrates is receiving attention. The Newnam hearth is proving successful, but it seems that its best work is on material with over 70 per cent. lead. There is still a field for work on concentrates carrying less than 65 per cent. lead, which are now mixed with fluxes and smelted in the blast furnace. Dwight suggests that a rich concentrate should be considered as a chemical substance rather than as an ore, and that a more rational process be devised for its treatment.

Mechanical Feeding.—The subject of mechanical feeding is discussed by L. Douglas Anderson, superintendent of the Midvale plant of the U. S. Smelting Co. (*Eng. & Min. Jour.*, c i, 1916, 885). The size of lead furnaces has been increased until mechanical feeding has become a necessity. All attempts were a failure until it was definitely established that the charge to work well must be distributed with the coarse particles at the center and the fines at the side. The first problem to be overcome was to fill the charge car uniformly and this has usually been done by hand. In these circumstances, the cheap labor required constant watching. The next improvement was to provide weighing hoppers under the bins into which the correct weights of the respective ingredients were drawn, and then dropped into the charge car. At the Midvale plant each car carries a hopper, mounted on scale beams, which is of the same length as the throat of the furnace. The bulk of the material is stored in hopper-bottom bins. Bedded ore is held in flat-bottom bins with undercut arc gates into which the beds are cut down by hand. The weighing car passes under the hoppers and receives the ore or flux by a belt discharge. The car is provided with a plunger to work the arc gates. The introduction of the above system at Midvale made it possible to cut down the charge

crew for five furnaces by over 50 men, and the regular and uniform feeding of the furnaces has resulted in an improvement in the furnace operation.

Smelting Plants.—The new plant of the Bunker Hill & Sullivan Co. at Kellogg, Idaho, is briefly described in the *Engineering and Mining Journal* (c i, 1916, 868). Wedge furnaces will be used for preliminary roasting for the Dwight-Lloyd machines. The sinter will be dumped into bins with weighing hoppers which discharge directly into charge cars. There will be three blast furnaces, 48 by 180 ins., at the tuyères. The bullion will be carried by an electric crane from the furnaces to the refining department. The refinery has two softening furnaces, four desilverizing kettles, two refining furnaces and four merchant kettles, also hard-lead and drossing furnaces. The silver refinery will have six retorts, two cupelling furnaces, one fine-silver furnace and a crucible furnace for gold melting. Sulphuric acid will be used for parting. The gases from all departments will be passed through a bag house.

Gold- and Silver-Bearing Matte.—The removal of gold and silver from matte and speiss is discussed by W. Mostowitsch (*Met. Chem. Eng.*, xiv, 703-6). He states that an artificial matte was made by fusing FeS and Cu_2S to make a 25 per cent. copper matte, and then some gold and silver added. It was found that by stirring in lead from 72 to 93.8 per cent. of the silver was extracted. The extraction increased with increase of lead and rise of temperature. With an amount of lead equal to 80 per cent. of the matte, all the gold was recovered. It was not possible to recover all of the silver; it is suggested that part of the Ag_2S forms a double sulphide with PbS.

Lead Sulphate.—Mostowitsch (*Bull. Am. Inst. Min. Engrs.*, May, 1916) gives the results of some researches on decomposing lead sulphate. He found that with heat alone SO_3 was evolved at 800° C., and that it increased in amount as the temperature was raised to the fusing point (950-1000° C.). No lowering of decomposition temperature is brought about by adding silica. The effect of silica seems to depend on the fluidity of the slag produced. The more viscous slags hinder the decomposition. The decomposition was most rapid with 10 to 15 per cent. SiO_2.

The comparative reducing effects of CO and C were studied also. It was found that the former began to act at 600° C., with evolution of SO_2, and the latter at 550°. The effect increases with temperature, the activity of the gas increasing more rapidly than that of the solid carbon. Simultaneously with the reduction occurs the reaction between $PbSO_4$ and PbS. When using in a blast furnace blast-roasted material which contains most of the sulphur as sulphate, much of the sulphur must be eliminated in the upper part of the blast furnace.

Lead Casting.—A patent has been issued to John F. Miller, Trail, B. C. (U. S. Pat. 1, 157, 794), for a lead casting wheel which has been used with success at the Trail plant of the Consolidated Mining & Smelting Co. Water-jacketed molds are used on a vertical wheel. On the feed side the periphery of the wheel is covered by a snugly fitting water jacket which closes the molds as they pass upward. A centrifugal pump feeds the lead to the molds through a pipe passing through the water jacket covering. A small recess in each mold allows the air to escape to the adjoining mold and collects a sample of the lead when the mold is filled. This method gives ingots of remarkably uniform weight and practically free from dross. No trimming is required. The wheel discharges onto a truck which is run directly to the shipping car.

ZINC

W. R. Ingalls

Commercial Conditions.—The boom which began in January, 1915, attained its zenith in June of that year, when the average price of spelter at St. Louis was 21 cents; the price then waned to 12.6 cents in August, recovered in November and extended into 1916, the average price in February being 18.25 cents. This marked the climax of the secondary spurt.

The rise to high levels in 1915 naturally stimulated new production, both by the opening of new mines and by the provision of new smelting capacity. The effect of this was anticipated by speculative selling which depressed the market. When it was seen that the rapidity of the development of new production had been over-estimated, the market rallied, but soon after February, 1916, the expected began to materialize and the market began to feel the weight of the new supplies. In May, June and July, the price slumped, the average in August, which is the lowest of the first 10 months of 1916, being 8.56 cents. The official statistics for the first half year showed that at mid-year there was an accumulation of unsold stocks as compared with Jan. 1.

Thus, after about 15 months of extravagance and frenzy, the spelter market finally settled upon a fairly steady basis, having regained the balance wheel of a stock on hand. This was promptly reflected in a contraction, even a disappearance, of the price differential between metal for prompt and distant delivery. At the same time, the price for high-grade spelter had declined to about 16 cents from a maximum of 40 cents, but at 16 cents it was still far above the ordinary premium over common. Since August, the price for common spelter has fluctuated between 8 and 10 cents save for an ephemeral rise to 13 cents in November. In December a sharp decline was experienced. Around 8 cents some of the makeshift smelling capacity becomes unprofitable. However, the building of new plant of enduring character has not yet ended and production is probably still increasing.

We can see already that the results of the unjointing of the American zinc industry have been almost cataclysmic. The galvanizing industry for ordinary peaceful purposes has been paralyzed. The U. S. Steel Corporation, the largest galvanizer engaged in the business, has provided its own supply of spelter and is no longer a figure in the market. In smelting there is a dearth of skilled labor, which commands far higher wages, and that together with increased cost of material has so advanced the cost of production that smelters estimate that a price of 7 or 8 cents per pound is no more profitable than 5 or 5½ cents used to be. Their trials are augmented by the increased inefficiency of labor, which is reflected disastrously by decreased metallurgical extraction. The producers of electrolytic spelter threaten a new and permanent competition. Sooner or later the zinc industry is going to be found to be enormously overbuilt and much plant will be rendered useless. The development of new zinc production in foreign countries is contributing toward this.

Foreign Markets.—The upheaval in the zinc industry was primarily due to the isolation of the Belgian and German smelters, which had previously taken the ore of Broken Hill, the largest single zinc-ore producing district. At first there was no other place to have that ore smelted, and the world's demand for spelter concentrated on the United States. Later the importation of a considerable tonnage of Australian ore into the United States helped, but the major part of the Australian ore still remains without a market. With the present organization of the industries of the British Empire, however, plans are being made to smelt all of the Australian ore in Australia, Great Britain and France. These plans will begin to fructify in 1917.

In the meantime the production of zinc in other countries has been increasing steadily, especially in Japan. A large, new smeltery in Siberia has gone into operation. Canada has begun the production of electrolytic spelter. Sweden and Norway have increased their output of electrothermic spelter. China has exported some of the product of her primitive furnaces. Much of this new production is still in driblets, but the aggregate is considerable. The institution of zinc production in so many widely separated parts of the world is remarkable and two years ago would have been unbelievable.

Refined Spelter.—Since the beginning of the war the great demand for spelter has been for brass making, brass being required in a variety of forms for munitions, for shipbuilding and for other purposes. For much of

this, a highly refined spelter is believed to be necessary. The high premium paid for it has stimulated refining by redistillation in several ways. This is done in the ordinary retort furnace. It is better done in a special furnace with large graphite retorts. In Norway and Sweden it is done by redistillation in electric furnaces.

Electrolytic Spelter.—The year has seen the electrolytic production of zinc direct from ore become an established art. This is due primarily to Mr. Laist and his colleagues of the Anaconda company, who have not evolved any new principles, but have worked out the details of those known 20 years ago in such a way as to make the process commercially practicable. An electrolytic plant capable of producing 50,000 tons of spelter per annum is going gradually into operation at Great Falls, Mont. Another large plant is in operation at Trail, B. C. Smaller plants are being erected in Utah and California. This new development has aroused great interest in foreign countries, like Italy, which possess cheap power and have zinc ore but no coal. In Tasmania a large plant to treat Broken Hill ore is already projected.

Electrolytic zinc production will not displace the old method of smelting, but it will establish itself in places where conditions are favorable. The essential conditions are cheap power, an ore that will give a good extraction of zinc by digestion with sulphuric acid, and an ore that is fairly high in silver or lead, or both.

Metallurgically the essential condition for successful zinc electrolysis is purity—purity of anodes (lead), of cathodes (aluminium), and of electrolyte. Purification of the electrolyte is not always easy to manage. The electrolytic spelter will always be of high grade—99.9 per cent. Zn or upward. (See also XXIV, *Electrochemistry.*)

Smelting.—In ordinary smelting there have been some innovations. Most important is the general spread of the idea among American smelters of burning the residues drawn from the retorts of the distilling furnaces on Wetherill grates, thus getting an additional quantity of zinc in the form of oxide, which is returned to the distilling furnaces. There is more tendency to pay attention to the matter of roasting furnaces in the hope of getting away from the clumsy Hegeler. A careful trial of the Wedge is shortly to be made. The idea of the Spirlet seems to gain strength. As to distilling furnaces, we hear from Germany of the success of the Roitzheim-Remy, with vertical retorts; also that among the standard types, the counter-current, recuperative form is being favored more and more as against the reversing regenerative. In the United States more remelting of spelter is being done. This is to insure uniformity of product, upon which the brass makers insist. Electrothermic smelting makes no headway, but continues to be practised at Trollhättan, Sarpsborg and Ilen in Scandinavia. Cote and Pierron are working at Epierre, in France, but are reported still to be having difficulty with condensation.

STATISTICS OF MINERAL PRODUCTION

WORLD'S PRINCIPAL MINERAL PRODUCTS, 1900–15

(In metric tons)

(*The Mineral Industry*)

	1900	1905	1910	1913	1914	1915
Aluminium	7,339	16,810	.....	78,716	86,390	86,240
Asphalt	322,896	309,629	367,626	.....	.....	.....
Coal	765,138,033	928,049,163	1,151,239,643	1,226,330,612	1,221,415,598	.....
Copper	491,435	698,931	877,494	1,002,284	934,888	1,061,283
Lead	849,168	988,727	1,093,043	1,142,264	.....	.....
Petroleum	19,484,471	29,878,112	44,228,588	51,351,136	52,800,542	.....
Phosphate rock	2,795,149	3,815,552	5,594,856	7,050,528	.....	.....
Pig iron	39,599,457	54,034,783	66,210,694	79,395,472	62,844,609	64,515,927
Steel	28,727,239	43,900,648	58,656,312	.....	.....	.....
Tin	82,117	100,795	115,759	126,878	111,226	112,281
Zinc	479,128	653,565	824,973	996,200	.....	.....

MINERAL PRODUCTION BY PRINCIPAL COUNTRIES, 1900–15

(In metric tons)

(*The Mineral Industry*)

	1900	1905	1910	1913	1914	1915
COAL						
Australasia	7,599,269	9,227.129	12,132,200	14,531,268	15,750,869[1]	.....
Austria-Hungary	39,107,786	41,952,008	47,943,109	54,112,272	41,460,000	52,679,712[1]
Belgium	23,462,817	21,775,280	23,916,560	22,858,000	19,000,000[1]	15,691,465[1]
France	33,404,298	35,218,000	38,349,942	40,050,888	33,360,885[1]	20,000,000[3]
Germany	149,788,256	173,810,669	222,375,076	191,511,154	161,535,224	259,139,786[1]
Japan	7,370,667	11,955,946	15,681,324	19,639,755	19,686,630	.....
Russia	16,156,055	18,727,766	24,026,000	32,206.000	33,113,000	31,158,400[1]
United Kingdom	228,772,886	239,906,999	268,676,528	292,047,544	270,070,414	283,570,560[1]
United States	243,414,164	351,120,625	445,816,040	517,285,050	465,994,080	517,371,921[1]
COPPER						
Africa	6,828	7,442	15,449	25,411	24,135	27,000
Australasia	23,368	34,483	40,962	47,326	37,592	32,512
Austria-Hungary	1,377	1,346	2,276	4,135	3,310	.....
Bolivia	2,134	2,032	2,540	3,658	2,743	3,000
Canada	8,595	21,595	23,810	34,587	34,027	47,202
Chile	26,016	29,126	38,346	40,195	40,876	47,142
Cuba	.....	.....	3,538	3,517	6,251	8,836
Germany	20,635	22,492	25,105	25,309	30,480	35,000
Italy	2,797	2,997	3,272	1,626	2,410	.....
Japan	28,285	35,944	50,703	73,152	68,058	75,000
Mexico	22,473	65,449	62,504	52,815	36,337	30,969
Norway	3,998	6,406	10,592	11,796	11,000	32,410
Peru	8,353	12,213	27,375	25,715	23,647	16,000
Russia	8,128	9,515	22,670	42,970	31,938	35,000
Spain-Portugal	53,718	45,527	51,080	54,696	37,099	.....
Sweden	457	1,385	2,032	1,016	.....	.....
United States	274,933	397,069	492,720	557,387	525,529	646,212
LEAD						
Australasia	87,100	106,418	105,897	116,000	.....	.....
Austria	10,650	12,968	15,476	22,312	.....	.....
Belgium	16,365	22,885	40,715	35,750	.....	.....
Canada	28,648	25,391	14,967	17,089	16,487	.....
France	15,210	24,100	20,226	28,000	.....	.....
Germany	121,513	152,590	159,851	181,100	.....	.....
Greece	16,396	13,729	16,710	18,309	20,684	.....
Italy	23,673	19,097	14,495	21,674	20,464	.....
Mexico	63,827	101,196	120,662	55,530	.....	.....
Spain	172,530	185,693	190,523	203,000	.....	.....
United Kingdom	35,500	28,494	30,799	30,500	.....	.....
United States	253,204	290,472	353,186	396,034	485,011	.....
PETROLEUM						
Dutch East Indies	.....	1,062,224	1,700,000	1,534,223	1,638,872[2]	12,800,000[4]
Galicia	.....	794,862	1,700,000	1,087,286	70,004[3]	9,000,000[4]
India	151,523	581,519	863,615	1,057,355	1,066,666[3]	85,000,000[4]
Rumania	250,000	614,870	1,352,300	1,885,225	1,783,947	12,650,000[4]
Russia	9,844,390	7,505,637	8,952,793	8,377,914	8,936,069	69,000,000[4]
United States	8,262,406	18,969,000	28,331,000	33,126,164	35,435,004	281,104,104[4]
PIG IRON						
Austria-Hungary	1,311,949	1,372,300	2,010,000	2,369,864	2,020,000	1,960,000
Belgium	1,018,561	1,310,290	1,852,090	2,484,690	1,560,000	.....
Canada	87,594	475,491	726,471	1,024,424	710,481	828,920
France	2,714,298	3,077,000	4,032,459	5,311,316	5,025,000	4,750,000
Germany	8,520,540	10,987,623	14,793,325	19,291,920	14,389,547	11,790,199
Italy	23,990	31,300	215,000	426,775	385,114	395,000
Russia	2,933,786	2,125,000	3,042,046	4,548,376	4,261,008	3,696,560
Spain	91,126	383,100	367,000	424,773	435,000	419,000
Sweden	526,868	531,200	604,300	735,000	635,100	767,600
United Kingdom	9,003,046	9,746,221	10,380,723	10,481,917	9,005,898	8,793,659
United States	14,009,870	23,340,258	27,636,687	31,482,406	23,721,111	30,414,816

[1] Short tons. [2] Includes British Borneo. [3] Estimated. [4] Barrels of 42 gals.

MINERAL PRODUCTION BY PRINCIPAL COUNTRIES, 1900–15—*Continued*

	1900	1905	1910	1913	1914	1915
STEEL						
Austria-Hungary	1,145,654	1,188,000	2,188,371	2,682,619	2,190,759	2,686,226
Belgium	655,199	1,023,500	1,449,500	.....	.....	.....
Canada	23,954	403,449	835,478	1,168,993	751,738	.....
France	1,565,164	2,210,284	3,506,497	4,419,241	.....	.....
Germany	6,645,869	10,066,553	13,698,638	18,958,819	15,619,719	13,237,646
Italy	115,887	117,300	635,000	911,500	.....	.....
Russia	2,217,752	2,208,000	3,479,000	4,827,000	.....	4,018,000
Spain	144,355	264,970	316,301	365,118	.....	.....
Sweden	300,536	340,000	468,600	582,700	500,600	588,800
United Kingdom	5,130,800	5,812,282	6,374,481	7,663,876	7,835,113	8,350,994
United States	10,382,069	20,354,291	26,512,437	31,822,555	23,904,914	32,686,887
ZINC						
Austria	6,742	9,204	13,305	20,000	.....	.....
Belgium	119,315	142,555	181,745	198,000	.....	.....
France	36,305	43,200	51,527	70,000	.....	.....
Germany	155,799	198,208	227,754	285,000	.....	.....
Holland	6,845	13,550	20,975	24,000	.....	.....
Russia	5,963	7,520	8,128	9,000	.....	.....
United Kingdom	30,207	50,125	63,587	59,000	.....	.....
United States	111,794	183,014	251,348	323,200	.....	.....

WORLD'S PRODUCTION AND COINAGE OF PRECIOUS METALS, 1851–1915

(*Report of the Director of the Mint*)

PERIOD	GOLD		SILVER		Commercial Ratio of Silver to Gold
	Fine Ounces	Value	Fine Ounces	Coining Value	
PRODUCTION:					
1851–1855 (average)	6,410,324	$132,513,000	28,488,597	$36,824,000	15.41
1856–1860 (average)	6,486,262	134,083,000	29,095,428	37,618,000	15.30
1861–1865 (average)	5,949,582	122,989,000	35,401,972	45,772,000	15.40
1866–1870 (average)	6,270,086	129,614,000	43,051,583	55,663,000	15.55
1871–1875 (average)	5,591,014	115,577,000	63,317,014	81,864,000	15.98
1876–1880 (average)	5,543,110	114,586,000	78,775,602	101,851,000	17.86
1881–1885 (average)	4,794,755	99,116,000	92,003,944	118,955,000	18.62
1886–1890 (average)	5,461,282	112,895,000	108,911,431	140,815,000	21.14
1891–1895 (average)	7,882,565	162,947,000	157,581,331	203,742,000	27.06
1896–1900 (average)	12,446,939	257,301,100	165,693,304	214,229,700	33.50
1901–1905 (average)	15,606,730	322,619,820	167,995,408	217,206,180	36.30
1906	19,471,080	402,503,000	165,054,497	213,403,800	30.54
1907	19,977,260	412,966,600	184,206,984	238,166,600	31.24
1908	21,422,244	442,476,900	203,131,404	262,634,500	38.64
1909	21,965,111	454,059,100	212,149,023	274,293,700	39.74
1910	22,022,180	455,239,100	221,715,763	286,662,700	38.22
1911	22,348,313	461,939,700	226,192,923	292,451,500	38.33
1912	22,549,335	466,136,100	224,310,654	261,402,300	33.62
1913	22,249,596	459,941,100	223,907,843	135,246,400	34.19
1914	22,039,598	455,676,600	211,103,377	116,719,200	37.49
1915	22,758,808	470,466,214	179,753,978	93,227,934	39.84
COINAGE:					
1873–1880 (average)	8,665,153	179,124,608	91,460,904	118,252,482	.....
1881–1890 (average)	5,898,643	121,935,781	97,881,838	126,554,296	.....
1891–1900 (average)	13,707,461	283,358,375	116,010,359	149,993,192	.....
1901–1905 (average)	13,645,423	282,075,960	137,801,324	178,852,964	.....
1906	17,721,058	366,326,788	120,339,501	155,590,466	.....
1907	19,921,014	411,803,902	171,561,490	221,816,867	.....
1908	15,828,573	327,205,649	151,352,824	195,688,499	.....
1909	15,153,116	313,242,714	87,728,951	113,427,331	.....
1910	22,004,542	454,951,834	78,786,842	108,934,541	.....
1911	18,002,444	372,143,555	117,237,838	148,156,282	.....
1912	17,447,478	360,671,382	161,763,415	171,293,019	.....
1913	15,494,784	320,305,619	155,497,316	155,265,702	.....
1914	5,081,928	248,585,071	192,501,238	106,476,285	.....
1915	.....	183,518,602	194,017,162	100,679,385	.....

MINERAL PRODUCTION OF THE UNITED STATES, 1900–15

(United States Geological Survey)

	1900	1905	1910	1913	1914	1915
METALS:						
Iron ore.....long tons	.....	42,526,133	56,889,734	59,643,098	39,714,280	55,493,100
Iron, pig....long tons	13,789,242	22,992,380	27,303,567	30,388,935	22,263,263	30,384,486
Steel.....long tons	10,188,329	20,023,947	26,094,919	31,300,874	23,513,030	32,151,036
Silver.....troy ounces	57,647,000	56,101,600	57,137,900	56,801,500	72,455,100	74,961,075
Gold.....troy ounces	3,829,897	4,265,742	4,657,018	4,299,784	4,572,976	4,887,604
Copper.....pounds	606,117,166	888,784,267	1,080,159,509	1,224,484,098	1,150,137,192	1,388,009,527
Lead.....short tons	270,824	302,000	372,227	411,878	512,794	507,026
Zinc.....short tons	123,886	203,849	252,479	337,252	343,418	458,135
Quicksilver.....flasks	28,317	30,451	20,601	20,213	16 548	21,033
Aluminium....pounds	*a*7,150,000	11,347,000	47,734,000	72,379,000	79,129,000	99,806,000
Antimonial lead..sh.t.	.....	.....	14,069	16,665	16,667	23,224
Platinum..troy ounces	400	318	773	1,034	6,324	8,665
NON-METALS:						
Fuels:						
Bitum. coal *b*....sh.t.	212,316,112	315,062,785	417,111,142	478,435,297	422,703,970	442,624,426
Penn. anthracite .l. t.	51,221,353	69,339,152	75,433,246	81,718,680	81,090,631	79,459,876
Coke.....short tons	.....	32,231,129	41,708,810	46,299,530	34,555,914	41,581,150
Petroleum....barrels	63,620,529	134,717,580	209,557,248	248,446,230	265,762,535	281,104,104
Struct'l Materials:						
Cement.....barrels	17,231,150	40,102,308	77,785,141	89,541,348	87,257,552	87,685,222
Lime.....short tons	.....	2,984,100	3,505,954	3,595,390	3,380,928	3,589,699
Sand & gravel...sh.t.	.....	23,204,967	67,949,347	77,764,049	77,662,086	74,719,259
Abrasive Materials:						
Corundum and emery.....short tons	4,305	2,126	1,028	957	485	3,063
Garnet....short tons	3,185	5,050	3,814	5,308	4,231	4,301
Pumice....short tons	.....	1,832	23,271	24,563	27,591	27,708
Chemical Materials:						
Arsenious oxide...lb.	.....	1,507,386	2,994,000	5,026,000	9,340,000	10,996,000
Borax (crude)...sh.t.	25,837	46,334	42,357	58,051	62,400	67,003
Bromine.....pounds	521,444	1,192,758	245,437	572,400	576,991	855,857
Fluorspar....sh. tons	18,450	57,385	69,427	115,580	95,116	136,941
Gypsum...short tons	594,462	1,043,202	2,379,057	2,599,508	2,476,465	2,447,611
Phosphate rock...l.t.	1,491,216	1,947,190	2,654,988	3,111,221	2,734,043	1,835,667
Pyrite.....long tons	204,615	253,000	241,612	341,338	336,662	394,124
Sulphur....long tons	*c* 3,525	181,677	255,534	311,590	327,634	.....
Salt.....barrels	20,869,342	25,966,122	30,305,656	34,399,298	34,804,683	38,231,496
Pigments:						
Barytes...short tons	67,680	48,235	42,975	45,298	52,747	108,547
Mineral paints..sh.t.	57,426	63,521	85,304			
Zinc oxide.....sh.t.	48,840	68,603	58,481	168,168	173,557	198,825
Miscellaneous:						
Asbestos...short tons	1,054	3,109	3,693	1,100	1,247	1,731
Asphalt...short tons	54,389	115,267	260,080	529,190	440,571	740,254
Bauxite....long tons	23,184	48,129	148,932	210,241	219,318	297,041
Chromic iron ore....long tons	140	22	205	255	591	3,281
Feldspar...short tons	24,821	35,419	81,102	120,955	135,419	113,769
Fuller's earth...sh.t.	9,698	25.178	32,822	38,594	40,981	47,901
Glass sand.....sh.t.	.....	1,060,334	1,461,089	1,791,800	1,619,649	1,884,044
Graphite....sh. tons	3,365	24,986	4,202	4,775	4,335	4,718
Magnesite...sh. tons	2,252	3,933	12,443	9,632	11,293	30,499
Manganese ore...l.t.	11,771	4,118	2,258	4,048	2,635	9,709
Manganiferous ore long tons	.....	.....	61,101	59,403	98,265	185,238
Mica.....pounds	11,450,283	3,176,875	10,606,190	12,344,677	8,016,933	557,780
Mineral waters gallons sold	45,276,995	46,544,361	62,030,125	57,867,399	54,358,466	52,113,503
Quartz....short tons	32,495	51,145	63,577	97,902	153,401	112,575
Talc and soapstone short tons	27,943	40,134	79,006	94,128	86,221	98,677
Talc, fibrous....sh.t.	63,500	56,500	71,710	81,705	86,075	88,214
Thorium minerals (monazite) and zircon .....pounds	908,006	1,352,418	99,301	.....	.....	.....
Tungsten ore ...sh.t.	40	803	1,821	1,537	990	.....

a Consumption. *b* Including brown coal and lignite, and anthracite mined elsewhere than in Pennsylvania.

VALUE OF MINERAL PRODUCTS OF THE UNITED STATES, 1900–15
(United States Geological Survey)

	1900	1905	1910	1913	1914	1915
METALS:						
Iron ore	$66,590,504	$75,165,604	$140,735,607	$130,905,558	$71,905,079	$101,288,984
Iron, pig (a)	259,944,000	382,450,000	412,162,486	458,342,345	298,777,429	401,409,604
Silver	35,741,100	34,221,976	30,854,500	40,348,100	40,067,700	37,397,300
Gold	79,171,000	88,180,700	96,269,100	88,884,400	94,531,800	101,035,700
Copper	98,494,039	137,761,561	137,180,257	189,795,035	152,968,246	242,902,000
Lead	23,561,688	28,690,000	32,755,976	36,245,264	39,998,000	47,660,000
Zinc	10,654,196	24,054,182	27,267,732	37,772,224	35,029,000	113,617,000
Quicksilver	1,302,586	1,103,120	958,153	813,171	811,680	1,826,912
Aluminium	1,920,000	3,246,300	8,955,700	13,845,000	14,522,700	17,985,500
Antimonial lead	.....	.....	1,338,090	1,591,854	1,572,167	3,665,736
Platinum	2,500	5,320	25,277	46,530	280,885	478,688
NON-METALS: (a)						
Fuels:						
Bituminous coal	220,930,313	334,658,294	469,281,719	565,234,952	493,309,244	502,037,688
Penna. anthracite	85,757,851	141,879,000	160,275,302	195,181,127	188,181,399	184,653,498
Coke	.....	72,476,196	99,742,701	128,922,273	88,334,217	105,503,868
Petroleum	75,989,313	84,157,399	127,899,688	237,121,388	214,125,215	179,462,890
Natural gas	.....	41,562,855	70,756,158	87,846,677	94,115,524	101,312,381
Structural Materials:						
Clay products	96,212,345	149,697,188	170,115,974	181,289,132	164,986,983	163,120,232
Cement	13,283,581	35,931,533	68,752,092	89,550,527	80,533,203	75,155,102
Lime	6,797,496	10,941,680	14,088,039	14,648,362	13,268,938	14,336,756
Sand and gravel	.....	11,223,645	21,037,630	22,321,517	22,278,969	21,514,977
Stone	36,970,777	63,798,748	76,520,584	83,732,995	77,544,103	74,595,352
Abrasive Materials:						
Grindstones	710,026	777,606	796,294	855,627	689,344	648,479
Corundum and emery	102,715	61,464	15,077	4,785	2,425	31,131
Garnet	123,475	148,095	113,574	183,422	145,510	139,584
Pumice	.....	5,540	94,943	55,408	59,172	63,185
Oilstones, etc	174,087	244,546	228,694	207,352	167,948	115,175
Chemical Materials:						
Arsenious oxide	.....	32,210	52,305	159,236	313,147	302,116
Borax (crude)	1,018,251	1,019,154	1,201,842	1,491,530	1,464,400	1,677,099
Bromine	140,790	178,914	31,684	115,436	203,094	856,307
Fluorspar	94,500	362,488	430,196	736,286	570,041	764,475
Gypsum	1,627,203	3,029,227	6,523,029	6,774,822	6,895,989	6,596,893
Phosphate rock	5,359,248	6,763,403	10,917,000	11,796,231	9,608,041	5,413,449
Pyrite	749,991	938,492	977,978	1,286,084	1,283,346	1,674,933
Sulphur	88,100	3,706,560	4,605,112	5,479,849	5,954,236	.....
Salt	6,944,603	6,095,922	7,900,344	10,123,139	10,197,417	11,747,686
Pigments:						
Barytes (crude)	188,089	148,803	121,746	156,275	155,647	381,032
Mineral paints	644,089	1,697,130	2,141,654	9,533,306	10,612,100	15,514,059
Zinc oxide	3,667,210	5,520,240	5,238,945			
Miscellaneous:						
Asbestos	16,310	42,975	68,357	11,000	18,965	76,952
Asphalt	415,958	758,153	3,080,670	5,282,370	3,659,092	5,242,073
Bauxite	89,676	240,292	716,258	997,698	1,069,194	1,514,834
Chromic iron ore	1,400	375	2,729	2,854	8,715	36,744
Feldspar	180,971	226,157	502,452	776,551	629,873	629,356
Fuller's earth	67,535	214,497	293,709	369,750	403,646	489,219
Glass sand	.....	1,107,730	1,516,711	1,895,991	1,568,030	1,606,640
Graphite	197,579	318,211	335,443	293,756	324,118	429,631
Magnesite	19,333	15,221	74,658	77,056	124,223	274,491
Manganese ore	100,289	36,214	22,892	40,480	27,377	111,309
Manganiferous ore	.....	.....	186,765	25,124	218,497	266,380
Mica	147,960	178,588	337,097	436,060	329,956	428,769
Mineral waters	5,791,805	6,491,251	6,357,590	5,631,391	4,892,328	5,138,794
Quartz	86,351	104,109	193,757	201,488	360,502	273,553
Talc & soapstone	383,541	637,062	684,213	1,119,597	1,043,801	1,026,739
Talc, fibrous	499,500	445,000	728,180	788,500	821,286	864,843
Thorium minerals (monazite), and zircon	48,805	163,908	12,006	.....	.....	.....
Tungsten ore	11,040	268,676	807,307	672,118	435,000	4,100,000

(a) "Spot" value, that is, value at the point of production.

MINERAL PRODUCTION BY STATES, 1900–15

(United States Geological Survey)

	1900	1905	1910	1913	1914	1915
METALS:						
COPPER (pounds):						
Alaska	.....	4,900,866	4,311,026	23,423,070	24,985,847	70,695,286
Arizona	118,317,764	226,854,461	297,250,538	404,278,809	382,449,922	432,467,690
California	28,511,225	16,697,489	45,760,200	32,492,265	29,784,173	37,658,444
Colorado	7,826,949	9,404,830	9,307,497	9,052,104	7,316,066	7,272,178
Idaho	290,162	7,321,585	6,877,515	8,711,490	5,875,205	6,217,728
Michigan	145,461,498	230,287,992	221,462,984	155,715,286	158,009,748	238,956,410
Montana	270,738,489	314,750,620	283,078,516	285,724,467	236,805,845	268,263,040
Nevada	407,535	413,292	64,494,640	85,209,536	60,122,904	67,757,322
New Mexico	4,169,400	5,334,192	3,784,609	50,196,881	64,204,703	62,817,234
Tennessee	.....	.....	16,691,777	19,489,654	18,661,112	18,205,308
Utah	18,354,726	54,083,506	125,185,455	148,057,450	160,589,660	175,177,695
GOLD (fine ounces):						
Alaska	395,271	722,026	787,148	735,364	800,471	808,346
Arizona	202,856	130,192	165,113	198,406	221,020	220,392
California	765,109	928,660	988,854	979,174	1,028,061	1,090,731
Colorado	1,394,622	1,243,291	992,967	876,057	962,779	1,089,928
Idaho	83,433	52,032	50,113	60,193	57,431	56,628
Montana	227,266	236,520	179,974	160,647	200,446	240,825
Nevada	97,050	259,246	913,015	579,408	558,064	574,874
New Mexico	40,292	12,858	23,084	43,149	58,974	70,632
Oregon	81,980	60,222	32,960	71,495	76,887	90,321
South Dakota	298,842	334,460	260,266	348,988	354,782	358,145
Utah	192,155	248,691	208,627	172,711	163,362	189,045
Washington	34,743	17,899	38,992	31,806	28,435	22,330
IRON ORE (long tons):						
Alabama	2,759,247	3,782,831	4,801,275	5,215,740	4,838,959	5,309,354
Michigan	9,926,727	10,885,902	13,303,906	12,841,093	10,796,200	12,514,516
Minnesota	9,834,399	21,735,182	31,966,769	38,658,793	21,946,901	33,464,660
New Jersey	344,247	526,271	521,832	325,305	350,135	415,234
New York	441,485	1,139,937	1,287,209	1,459,628	785,377	998,845
Ohio	.....	.....	.....	7,849	5,138	3,455
Pennsylvania	877,684	808,717	739,799	489,056	406,326	363,309
Tennessee	594,171	734,770	732,247	370,002	330,214	284,185
Virginia	a921,821	.....	903,377	483,843	378,520	348,042
Wisconsin	746,105	859,283	1,149,551	1,018,272	886,512	1,095,388
IRON, PIG (long tons):						
Alabama	1,184,337	1,604,062	1,939,147	2,057,911	1,826,929	2,049,453
Illinois	1,363,383	2,034,483	2,675,646	2,927,832	1,847,451	2,447,220
New York	292,827	1,198,068	1,938,407	2,065,825	c1,559,864	d2,104,780
Ohio	2,470,910	4,586,110	5,752,111	7,129,525	5,283,426	6,912,962
Pennsylvania	6,365,935	10,579,127	11,272,323	12,954,936	9,733,369	12,790,668
Tennessee	362,190	372,692	397,569	280,541	216,738	177,729
Virginia	490,617	510,210	444,976	341,815	271,228	251,346
LEAD (short tons):						
Colorado	82,137	56,638	38,542	42,840	41,198	32,352
Idaho	85,444	99,027	109,951	137,802	177,827	160,680
Missouri	.....	b104,058	161,659	152,430	194,275	195,634
Utah	48,044	44,996	60,605	71,069	88,976	106,105
Wisconsin	.....	.....	3,909	2,639	1,818	2,632
SILVER (fine ounces):						
Arizona	2,995,500	2,605,700	2,655,700	3,912,000	4,439,500	5,665,672
California	941,400	1,082,000	1,791,600	1,421,500	2,020,800	1,689,924
Colorado	20,483,900	12,942,800	8,523,000	8,989,700	8,804,400	7,199,745
Idaho	6,429,100	8,125,600	7,027,000	9,477,100	12,573,800	13,042,466
Michigan	102,000	253,000	262,200	333,700	415,500	581,874
Montana	14,195,400	13,454,700	12,282,900	12,540,300	12,536,700	14,423,173
Nevada	1,358,700	5,863,500	12,366,000	15,657,400	15,877,200	14,453,085
New Mexico	434,300	354,900	779,000	1,666,900	1,771,300	2,337,064
South Dakota	536,200	179,000	120,600	172,600	179,800	197,569
Texas	477,400	417,200	364,400	429,800	574,700	724,580
Utah	9,267,600	10,319,800	10,445,900	11,282,300	11,722,000	13,073,471
Washington	224,500	119,400	204,900	218,700	341,300	213,877
ZINC (short tons):						
Colorado	.....	6,599	23,238	58,113	41,746	e52,297
Kansas	62,136	114,287	10,220	9,956	10,634	e14,365
Missouri	14,741	11,844	140,652	129,018	114,019	e136,300
Montana	.....	.....	12,408	35,604	55,986	e93,573
New Jersey	.....	.....	20,217	24,247	27,734	e116,618
Utah	.....	.....	7,221	9,503	6,818	e12,146
Wisconsin	.....	.....	19,752	33,743	30,914	e41,403

a Includes production of West Virginia. *b* Includes production of entire Mississippi Valley.
c Including New Jersey. *d* Including New York. *e* Mine production.

MINERAL PRODUCTION BY STATES, 1900–15—*Continued*

	1900	1905	1910	1913	1914	1915
NON-METALS:						
CEMENT (barrels):						
California	44,565	1,225,429	5,805,098	6,159,182	5,075,114	4,503,306
Illinois	240,442	1,545,500	4,459,450	5,083,799	5,401,605	5,156,869
Indiana	30,000	3,127,042	7,219,199	10,872,574	9,595,923	8,145,401
Iowa	.....	.....	.....	3,623,674	4,233,707	4,559,630
Kansas	80,000	230,686	5,655,808	3,374,836	3,431,142	3,580,287
Michigan	664,750	2,773,283	3,687,719	4,186,236	4,285,345	4,765,294
Missouri	.....	3,879,542	4,455,589	4,803,338	4,723,906	4,626,771
New Jersey	1,169,212	3,654,777	4,184,698	4,460,027	3,674,800	1,579,173
New York	465,832	2,111,411	3,296,350	5,208,020	5,886,124	5,043,889
Pennsylvania	4,984,417	13,813,487	26,675,978	28,701,845	26,570,151	28,648,941
COAL (short tons):						
Alabama	8,394,275	11,866,069	16,111,462	17,678,522	15,593,422	14,927,937
Arkansas	1,447,945	1,934,673	1,905,958	2,234,107	1,836,540	1,652,106
Colorado	5,244,364	8,826,429	11,973,736	9,232,510	8,170,559	8,624,980
Illinois	25,767,981	38,434,363	45,900,246	61,618,744	57,589,197	58,829,576
Indiana	6,484,086	11,895,252	18,389,815	17,165,671	16,641,132	17,006,152
Iowa	5,202,939	6,798,609	7,928,120	7,525,936	7,451,022	7,614,143
Kansas	4,467,870	6,423,979	4,921,451	7,202,210	6,860,988	6,824,474
Kentucky	5,328,964	8,432,523	14,623,319	19,616,600	20,382,763	21,361,674
Maryland	4,024,688	5,108,539	5,217,125	4,779,839	4,133,547	4,180,477
Michigan	849,475	1,473,211	1,534,967	1,231,786	1,283,030	1,156,138
Missouri	3,540,103	3,983,378	2,982,433	4,318,125	3,935,980	3,811,593
Montana	1,661,775	1,643,832	2,920,970	3,240,973	2,805,173	2,789,755
New Mexico	1,299,299	1,649,933	3,508,321	3,708,806	3,877,689	3,817,940
Ohio	18,988,150	25,552,950	34,209,668	36,200,527	18,843,115	22,434,691
Oklahoma	1,922,298	2,924,427	2,646,226	4,165,770	3,988,613	3,693,580
Pennsylvania: Anth	57,367,915	77,659,850	84,485,236	91,524,922	90,821,507	88,995,061
Pennsylvania: Bitum	79,842,326	118,413,637	150,521,526	173,781,217	147,983,294	157,955,137
Tennessee	3,509,562	5,766,690	7,121,380	6,860,184	5,943,258	5,730,361
Texas	968,373	1,200,684	1,892,176	2,429,144	2,323,773	2,088,908
Utah	1,147,027	1,332,372	2,517,809	3,254,828	3,103,036	3,108,715
Virginia	2,393,754	4,275,271	6,507,997	8,828,068	7,959,535	8,122,596
Washington	2,474,093	2,864,926	3,911,899	3,877,891	3,064,820	2,429,095
West Virginia	22,647,207	37,791,580	61,671,019	71,254,136	71,707,626	77,184,069
Wyoming	4,014,602	5,602,021	7,533,088	7,393,066	6,475,293	6,554,028
COKE (short tons):						
Alabama	2,110,837	2,576,986	3,249,027	3,323,664	3,084,149	3,071,811
Colorado	618,755	1,378,824	*e*1,346,211	879,461	666,083	670,938
Illinois	.....	10,307	1,514,504	1,859,553	1,425,168	1,686,998
New Mexico	44,774	89,638	401,646	467,945	362,572	389,411
Ohio	72,116	277,130	282,315	351,846	521,638	484,658
Pennsylvania	13,357,295	20,573,736	26,315,607	28,753,444	20,258,393	25,622,862
Tennessee	475,432	468,092	322,756	364,578	264,127	256,973
Virginia	685,156	1,499,481	1,493,655	1,303,603	780,984	629,807
West Virginia	2,358,499	3,400,593	3,803,850	2,472,752	1,427,962	1,391,446
NATURAL GAS (values):						
California	$79,083	$133,696	$476,697	$1,883,450	$2,910,784	$4,069,004
Illinois	1,700	7,223	613,642	574,015	437,275	350,371
Indiana	7,254,539	3,094,134	1,473,403	843,047	755,407	695,380
Kansas	356,900	2,261,836	7,755,367	3,288,394	3,340,025	4,037,011
New York	335,367	623,251	1,678,720	2,425,633	2,600,352	2,335,252
Ohio	2,178,234	5,721,462	8,626,954	10,521,930	14,667,790	17,391,060
Oklahoma	.....	150,137	3,490,704	7,436,389	8,050,039	9,195,804
Pennsylvania	10,215,412	19,197,336	21,057,211	21,695,845	20,401,295	21,139,605
West Virginia	2,959,032	10,075,804	23,816,553	34,164,850	35,076,755	36,424,263
PETROLEUM (bbls.):						
California	4,324,484	33,427,473	73,010,560	97,788,525	99,775,327	97,915,243
Colorado	317,385	376,238	239,794	188,799	222,773	208,475
Illinois	200	181,084	33,143,362	23,893,899	21,919,749	24,942,701
Indiana	4,874,392	10,964,247	2,159,725	956,099	1,335,456	875,758
Kansas	74,714	*c*12,013,495	1,128,668	2,375,029	3,103,585	2,823,487
Louisiana	.....	8,910,416	6,841,395	12,498,828	14,309,435	18,191,539
New York	.....	1,117,582	1,053,838	902,211	938,974	887,778
Ohio	22,362,730	16,346,660	9,916,370	8,781,468	8,536,352	7,825,326
Oklahoma	6,472	*d*	52,028,718	63,579,384	73,631,724	97,915,243
Pennsylvania	.....	10,437,195	8,794,662	7,963,282	8,170,335	7,838,705
Texas	836,039	28,136,189	8,899,266	15,009,478	20,068,184	24,942,701
West Virginia	16,195,675	11,578,110	11,753,071	11,567,299	9,680,033	9,264,798

c Includes production of Oklahoma. *d* Included with figures for Kansas. *e* Includes production of Utah.

IMPORTS AND EXPORTS OF MINERAL PRODUCTS, 1900–16

(U. S. Statistical Abstract)

(000 omitted)

	1900	1905	1910	1911	1913	1914	1915	1916
IMPORTS:								
Aluminium	.....	.....	.....	.....	$5,055	$4,148	$2,999	$1,977
Antimony (ore and metal)	$341	$363	$551	$541	1,134	696	1,420	8,039
Asbestos, unmanufactured	293	706	1,122	1,318	1,760	1,678	1,513	2,625
Manufactures of	15	53	269	293	395	391	230	170
Bismuth	225	305	316	321	.....	.....	.....	.....
Cement	.....	1,276	602	324	122	160	132	9
Clays or earths	1,035	1,272	2,076	2,107	2,394	2,246	1,983	1,705
Coal	4,476	3,906	4,469	5,018	4,376	3,700	4,179	4,866
Coke	232	835	521	558	463	537	398	290
Copper: in ore, matte, etc.	3,032	4,892	9,272	7,659	13,667	13,696	11,228	22,851
In pigs, ingots, etc.	12,457	19,942	30,938	32,013	45,909	40,809	20,432	52,927
Emery and other abrasives	201	309	473	502	.....	.....	.....	.....
Gold	44,573	53,648	43,339	73,607	69,194	66,538	171,568	494,009
Iron and Steel:								
Iron ore	1,497	1,670	6,763	6,691	7,035	6,984	3,823	4,618
Pig iron, including ferro-silicon	2,109	2,989	6,289	6,056	6,402	1,782	4,235	7,424
Scrap iron and steel	562	174	1,507	304	463	346	281	1,012
Manufactures of	17,806	20,346	33,213	29,623	26,770	26,550	22,703	23,393
Lead, ore and base bullion	3,128	3,616	3,643	4,038	3,397	1,987	2,574	3,358
Pig and manufactured	27	296	279	167	20	69	91	578
Manganese, ore and oxide of	2,693	1,661	1,592	1,453	2,196	1,841	1,494	5,358
Marble and manufactures of	812	1,308	1,552	1,477	1,393	1,335	894	729
Nickel ore and matte	1,070	1,205	3,618	3,946	6,398	6,109	5,074	9,520
Oils, mineral	220	494	610	2,143	9,216	13,665	9,790	12,512
Phosphates, crude	504	750	152	.....	.....	.....	.....	.....
Plaster rock	242	361	426	422	.....	.....	.....	.....
Platinum	1,832	1,959	3,345	3,983	5,213	3,975	1,630	4,256
Salt	625	496	395	401	377	423	391	330
Silver	35,256	27,484	45,217	45,937	41,268	30,326	29,110	34,154
Sulphur ore	1,224	1,694	2,626	3,108	4,111	3,695	4,107	7,121
Talc	1	47	115	83	.....	.....	.....	.....
Tin	19,104	23,378	30,869	37,935	53,112	39,422	30,777	50,877
Zinc, ore	.....	229	1,139	937	831	251	1,818	10,425
Manufactures of	171	60	870	282	1,911	364	272	523
EXPORTS:								
Aluminium and manufactures of	244	175	666	1,330	1,046	1,101	3,245	5,644
Asbestos and manufactures of	93	234	312	404	688	687	535	1,019
Asphaltum and manufactures of	121	291	702	868	1,640	1,493	1,016	1,341
Cement	163	1,484	2,292	4,349	5,822	3,382	3,241	3,781
Coal	19,502	29,158	40,512	45,013	65,097	59,921	55,906	65,958
Coke	1,233	2,228	3,077	3,300	3,318	2,789	2,304	3,779
Copper, ore and matte	1,009	1,338	1,304	1,095	2,958	3,257	220	.....
Manufactures of	57,852	86,225	88,004	103,813	140,164	146,222	99,558	173,946
Emery and corundum	170	347	872	1,347	2,311	2,114	1,802	3,333
Gold	48,266	92,594	118,563	22,509	77,762	112,038	146,224	90,249
Graphite	21	43	302	407	496	656	520	892
Iron and Steel:								
Iron ore	79	581	1,637	2,496	3,684	3,401	1,277	2,797
Pig iron	.....	828	1,353	2,475	4,141	2,859	2,071	5,847
Scrap iron and steel	749	270	281	794	1,435	841	359	2,481
Manufactures of	118,039	133,630	177,497	227,451	299,029	247,779	223,431	612,881
Lead, manufactures of	205	499	481	729	589	2,610	1,117	2,483
Marble and Stone:								
Unmanufactured	120	227	413	607	609	676	443	364
Manufactures of	1,556	1,055	1,034	1,082	1,626	1,470	831	1,075
Nickel, nickel oxide and matte	1,219	3,196	4,532	6,004	9,275	9,403	11,110	9,876
Manufactures of	.....	97	80	252	.....	.....	.....	.....
Oils, mineral	75,611	79,793	99,090	98,115	137,237	152,174	133,693	166,423
Phosphate rock	6,376	6,886	7,454	9,068	9,524	10,617	1,742	1,763
Plaster	.....	16	6	16	391	283	189	187
Platinum	61	10	43	105	.....	.....	.....	.....
Quicksilver	556	653	256	20	21	32	155	272
Salt	55	190	286	329	441	542	616	601
Silver	56,712	48,848	55,286	64,749	71,614	54,965	50,942	59,792
Tin, scrap	44	29	64	46	.....	.....	.....	.....
Manufactures of	387	721	879	999	1,453	1,477	1,786	3,088
Zinc, ore and dross	1,205	1,765	881	949	690	588	695	177
Manufactures of	1,669	1,319	196	829	1,063	406	21,243	45,867

XIX. MANUFACTURES

W. M. Steuart

General Conditions.—The opening of the year 1916 found domestic finances in an unusually sound condition. Funds were abundant for all legitimate industrial requirements and apparently there was no lack of the confidence essential to the launching and promotion of important projects. There had been a marked increase in activity in many lines of industry during the last half of 1915, and 1916 started with a record production. Forward contracts had accumulated to such an extent that they insured a continuation of exceptional activity in most branches of industry. There were fully twice as many furnaces in blast as on the same date in 1915. The steel industry was sold ahead in excess of all expectations, and all signs pointed to record achievements during the year. As the year advanced the financial situation continued to improve. By June the bank clearings were 46 per cent. greater than in the preceding year, and 48 per cent. in excess of the total in 1914. The unusual activity created a demand for skilled labor that was difficult to meet. The shortage of labor and wage controversies prevented the full running of machinery in some industries. There was a constant tendency to increase wages, and hardly a week passed that did not give ample evidence of the desire of employers to placate their workers rather than run the risk of disorganizing forces, not to mention the inconveniences caused by strikes (see also XVI, *Labor*). The production for most of the staple crops was short; this and the unusual demand for raw material tended to increase prices rapidly. A shortage in transportation facilities also developed during the spring and summer, and some manufacturers not only found it difficult to get a sufficient supply of raw material, but to effect a prompt delivery of their finished products. The condition in domestic manufactures was reflected most clearly by the increase in the exports. For the first nine months of the year the value of the exports was much greater than for the 12 months of any preceding calendar year, exceeding even 1915 by 400 million dollars. While this great increase was due in part to the higher prices that prevailed during the year, the balance remaining after allowing for that factor is very considerable.

The rapid and unprecedented increase in prices of material, demands for increased wages, restrictions concerning the delivery of finished products, and the fact that contracts were effected when other conditions prevailed, made it difficult for manufacturers in some lines to operate satisfactorily, although they were overcrowded with business. Needless to say, the stimulating factor in the rise of prices in most commodities was the almost insatiable war demand. The value of the exports affected by the war for the fiscal year ended June 30, 1916, was given as $1,163,000,000, as compared with $186,000,000 for 1914 (see also XX, *External Commerce of the United States*). It was evident that the unprecedented increase was due in large measure to the European demand. The purely domestic business in steel and many other products was slightly, if any, above domestic requirements. The first six months of the year were probably the most active ever experienced by the manufacturers in most of the basic industries. With the beginning of the second half of the year, there was a notable absence of the usual low ebb in industry that usually comes during the summer months. This was due to the heavy expenditures by the Government for numerous articles required to pro-

vision the troops needed in Mexico or along the border, and also by foreign inquiries for steel, predicated upon fears that the United States would commandeer supplies of essential munitions. (See also XIII, *Economic Conditions.*)

Industrial Failures.—The prosperous conditions in industry were reflected in the number of failures, which showed a marked reduction from the high mortality of 1915 (*A. Y. B.*, 1915, pp. 332, 516). The following statement shows the magnitude of the failures in manufactures in the different geographic divisions during the first nine months of 1915 and 1916: it shows clearly that the betterment in industrial mortality was very general throughout the country:

	Number		Liabilities	
	1916	1915	1916	1915
New England....	464	479	$5,811,169	$5,875,541
Middle Atlantic.	1,097	1,442	22,390,767	28,785,848
South Atlantic.	212	324	4,386,016	8,096,777
South Central..	232	301	5,638,492	4,784,609
Central East....	594	669	9,529,441	32,422,774
Central West....	241	282	2,317,765	4,030,655
Western..	40	36	4,601,828	224,899
Pacific...	346	364	4,439,183	5,476,906
Total...	3,226	3,897	$59,214,661	$89,698,009

During the first nine months of the year the insolvencies in manufactures, trading and commerce numbered 13,250 and involved $154,586,707 of defaulted indebtedness, as compared with 17,288 with liabilities amounting to $241,464,060 in 1915. There were 3,226 suspensions in manufactures with $59,214,661 indebtedness, while for the same period for 1915 the suspensions numbered 3,897 and involved $89,698,009.

Magnitude of Domestic Manufactures.—All industrial and commercial reports agree that the year was one of immense business, extraordinary activity in industry, unusual demand for money, remarkably good collections, heavy railway traffic, and noteworthy strength in prices. It is evident, therefore, that the value of the products manufactured during the year was much greater than for any preceding twelve-month period of the country's history. The exact magnitude of the operations can only be determined by an enumeration of each factory. The interests involved are so vast and diversified that it is impossible to collect such statistics for the entire country, compile and publish them until some months after the period to which they relate. The Federal Government, through the Bureau of the Census, took a census of domestic manufactures for 1914 and commenced to publish the results during the fall of 1915, but the general totals for all industries in the entire country were not finished until the summer of 1916. These general totals are summarized in the following statement:

	1914	1909	Per cent. of Increase, 1909–1914 [1]
Number of establishments	275,791	268,491	2.7
Persons engaged in manufactures	8,265,426	7,678,578	7.6
Proprietors and firm members	264,872	273,265	−3.1
Salaried employees	964,217	790,267	22.0
Wage earners (average number employed)	7,036,337	6,615,046	6.4
Primary horsepower	22,547,574	18,675,376	20.7
Capital	$22,790,980,000	$18,428,270,000	23.7
Services	5,367,249,000	4,365,613,000	22.9
Salaries	1,287,917,000	938,575,000	37.2
Wages	4,079,332,000	3,427,0?8,000	19.0
Materials	14,368,089,000	12,142,791,000	18.3
Value of products	24,246,435,000	20,672,052,000	17.3
Value added by manufacture (value of products less cost of materials)	9,878,346,000	8,529,261,000	15.8

[1] A minus sign (−) denotes decrease.

The year 1914, especially the last few months, was a period of industrial depression (*A. Y. B.*, 1914, p. 318). This is shown by a decrease in the number of wage earners employed during October, November, and De-

cember, as compared with the numbers employed in the other months. Notwithstanding the depression of 1914, the statistics show that the net result of the increases and decreases that had occurred during the preceding five years was a decided gain in the magnitude of the manufactures of the country. The value of the products for 1914 were 17.3 per cent. greater than those for 1909, and the horsepower employed had increased by 20.7 per cent. The manufacturers gave employment to 6.4 per cent. more wage earners during the depressed period of 1914 than during the highly prosperous year of 1909. The average number of wage earners is the number that would be required to perform the work done if all were constantly employed during the year. In some industries, such as the canning and preserving of fruits and vegetables, large numbers are employed for short periods and but a few for the remainder of the year. Therefore, the average does not indicate the magnitude of employment. During 1914 the greatest number of wage earners, 7,242,752, was employed in March, while the peak of employment in 1909 was during November, when 7,006,853 were at work.

The statistics reflect some of the important changes that are taking place in the manufactures of the country. The great increase in the number of corporations and the magnitude of their operations have caused an actual decrease in the number of proprietors and firm members which represent the establishments operated by individuals and private firms. During the five years intervening between the censuses the number of establishments operated by corporations increased from 69,501 to 78,151, the number of wage earners employed in such establishments from 5,002,393 to 5,649,646, and the value of their products from $16,341,116,634 to $20,177,084,844. In 1909 the wage earners employed by corporations and the value of their products formed 75.6 and 79.0 per cent., respectively, of the totals for all establishments. By 1914 these proportions had increased to 80.3 and 83.2 per cent. During the past 15 years the number of officers, clerks, and other salaried employees of manufacturing establishments has formed a constantly increasing proportion of the total number of all employees. This, of course, has been accompanied by a decrease in the proportion of wage earners who represent the producing force. The condition is due in part to the extension of corporations, as the proprietors and members of firms naturally become "salaried officials" of concerns that are incorporated. Another reason, and probably the most important, is the tendency to elaborate the accounting and auditing systems, the employment of salaried persons to develop and exploit improved methods in both the office and factory, as well as in the sale of the products.

The following statement is an analysis of the working force of the manufactures of the country, as reported for the past three censuses of manufactures:

Class	Employees in Manufacturing Industries		
	1914	1909	1904
Superintendents, managers, clerks, and other subordinate salaried employees, total	871,546	709,532	459,509
Males, number	680,290	567,360	381,181
Per cent. of total	78.1	80.0	83.0
Females, number	191,256	142,172	78,328
Per cent. of total	21.9	20.0	17.0
Wage earners, total	7,036,337	6,615,046	5,468,383
Males 16 years of age and over, number	5,522,255	5,163,164	4,242,643
Per cent. of total	78.5	78.1	77.6
Females 16 years of age and over, number	1,389,106	1,290,389	1,065,855
Per cent. of total	19.7	19.5	19.5
Children under 16, number	124,976	161,493	159,885
Per cent. of total	1.8	2.4	2.9

Of the 8,265,426 persons reported as engaged in manufacturing in 1914, 6,615,509, 80 per cent., were males, and 1,649,917, 20 per cent., females.

The statistics reflect the effect of the laws restricting the employment of children. It is probable that some employers do not know the ages of their employees and there may be a tendency in some localities to evade the law. The figures, however, show a constant decrease in the percentage of children employed. This has been accompanied by an increase in the proportion of both men and women employed. The employment of women is confined largely to those industries in which the processes require dexterity rather than strength. In the manufacture of corsets, artificial flowers and feathers and plumes, millinery and lace goods, men's furnishing goods, hosiery and knit goods, the making of women's clothing, the manufacture of fancy and paper boxes, the confectionery industry, the manufacture of silk and silk goods, the making of men's clothing, and the manufacture of leather gloves and mittens, more than half of the wage earners in 1914 were females 16 years of age or over.

Control of Manufactures by Corporations.—Of the 275,791 establishments reported at the census of 1914, 142,436, or 51.6 per cent., were operated by individuals; 78,151, or 28.3 per cent., by corporations; and 55,204, or 20.0 per cent., by other forms of ownership. While the corporations operate a comparatively small proportion of the establishments, they gave employment to 80.3 per cent. of the wage earners employed in all industries in the entire country, and the value of their products formed 83.2 per cent. of the products reported for all establishments. Where a large investment in plant and machinery is necessary to the proper conduct of the business, the establishments are, as a rule, operated by corporations, it being easier under this form of ownership to obtain the necessary capital. The general tendency has been toward an increase in the relative importance of the corporations in the manufacturing industries.

Increase in Number of Large Establishments.—More than 67 per cent. of the manufacturing establishments in the United States have an annual production of less than $20,000. There were 184,992 establishments of this size enumerated at the last census, but their products formed only 4.7 per cent. of the total for all. On the other hand, the large establishments, those which had an annual product valued at $100,000 or more, numbered 33,985, and formed only 12.3 per cent. of the total, but their products amounted to more than 20 billion dollars, and formed 84.8 per cent. of the total for all establishments.

Rank of the States in Manufactures.—While important manufacturing enterprises are operated in all of the states, as well as in the District of Columbia, the establishments in the 15 states shown in the following statement produce a very large proportion of the total products for the entire country; the products of the factories in these states during 1914 were valued at $19,365,884,491, and formed 79.9 per cent., and the wage earners employed numbered 5,440,118, and formed 77.3 per cent., of the total for all states:

State	Rank of the Principal Manufacturing States in					
	Number of Wage Earners			Value of Products		
	1914	1909	1904	1914	1909	1904
New York	1	1	1	1	1	1
Pennsylvania	2	2	2	2	2	2
Illinois	5	4	4	3	3	3
Ohio	4	5	5	4	5	5
Massachusetts	3	3	3	5	4	4
New Jersey	6	6	6	6	6	6
Michigan	7	7	8	7	7	8
Indiana	9	9	9	8	9	10
California	12	13	12	9	11	12
Wisconsin	10	10	10	10	8	9
Missouri	11	11	11	11	10	7
Connecticut	8	8	7	12	12	11
Minnesota	18	18	19	13	13	13
Maryland	15	15	14	14	15	14
Texas	23	25	27	15	17	22

The table on the following page shows the distribution of manufactures among the geographical divisions of the country.

Concentration of Industries.—Some industries show a decided tendency for local concentration. The automobile industry reported products valued at $632,831,000 for 1914. Of this amount, $398,289,000, or 62.9 per cent., was produced in the state of Michigan, and $164,076,000, or 25.9 per cent., in the city of Detroit. The

GEOGRAPHICAL DISTRIBUTION OF MANUFACTURES

Division and State	Census Year	Number of Establishments	Wage Earners (Average Number)	Primary Horsepower	Capital (thousands)	Wages (thousands)	Value of Products (thousands)
United States	1914	275,791	7,036,337	22,547,574	$22,790,980	$4,079,332	$24,246,435
	1909	268,491	6,615,046	18,675,376	18,428,270	3,427,038	20,672,052
	1904	216,180	5,468,383	13,487,707	12,675,581	2,610,445	14,793,903
New England	1914	25,193	1,140,233	3,125,629	2,948,040	628,409	2,926,676
	1909	25,351	1,101,290	2,715,121	2,503,854	557,631	2,670,065
	1904	22,279	940,752	2,125,815	1,870,995	439,050	2,025,999
Middle Atlantic	1914	85,466	2,355,940	6,699,576	7,836,071	1,370,131	8,053,644
	1909	81,315	2,207,747	5,531,502	6,505,675	1,182,568	7,141,761
	1904	67,699	1,886,565	4,255,264	4,742,357	926,145	5,218,266
East-North-Central	1914	59,896	1,680,281	5,464,935	5,913,681	1,073,538	6,542,261
	1909	60,013	1,513,764	4,382,070	4,547,225	827,152	5,211,702
	1904	51,754	1,224,528	3,120,369	2,895,446	615,643	3,605,368
West-North-Central	1914	27,199	381,595	1,241,940	1,424,181	235,471	2,032,192
	1909	27,171	374,337	1,101,990	1,171,572	204,792	1,803,899
	1904	21,492	312,361	753,700	857,904	157,843	1,284,446
South Atlantic	1914	28,925	685,342	2,274,785	1,644,539	293,063	1,682,999
	1909	28,088	663,015	1,832,001	1,368,475	244,378	1,381,186
	1904	19,564	522,611	1,221,040	930,420	175,461	974,028
East-South-Central	1914	14,410	264,378	1,157,367	713,357	117,987	700,668
	1909	15,381	261,772	1,036,560	586,276	102,191	630,488
	1904	10,311	221,229	753,928	405,361	83,942	464,336
West-South-Central	1914	12,417	211,940	1,010,050	687,819	116,128	802,538
	1909	12,339	204,520	873,350	547,739	97,646	625,443
	1904	8,279	143,470	555,717	328,906	67,128	415,232
Mountain	1914	6,079	81,113	463,478	469,971	66,358	437,568
	1909	5,254	75,435	400,766	348,977	56,870	363,996
	1904	3,610	52,790	241,825	220,569	39,046	254,663
Pacific	1914	16,206	235,515	1,109,814	1,153,321	178,247	1,067,889
	1909	13,579	213,166	802,016	848,477	153,810	843,512
	1904	11,192	164,077	460,049	423,623	106,187	551,565

STATISTICS OF THE LEADING MANUFACTURING CENTERS

	Number of Establishments		Average Number of Wage Earners		Value of Products	
	1914	1909	1914	1909	1914	1909
New York, N. Y.	29,621	25,938	585,279	554,002	$2,292,831,693	$2,029,692,576
Chicago, Ill	10,115	9,656	313,710	293,977	1,438,498,416	1,281,171,181
Philadelphia, Pa	8,454	8,379	251,286	251,884	784,499,633	746,075,629
Detroit, Mich	2,036	2,036	99,603	81,011	400,347,912	252,992,123
St. Louis, Mo	2,787	2,667	85,058	87,371	360,479,868	328,495,313
Cleveland, Ohio	2,345	2,148	103,317	84,728	352,418,052	271,960,333
Boston, Mass	3,138	3,155	78,894	69,637	284,802,479	237,457,472
Buffalo, N. Y	2,225	1,753	54,416	51,412	247,516,476	218,803,994
Pittsburgh, Pa	1,741	1,659	69,620	67,474	246,694,018	243,453,693
Milwaukee, Wis	1,728	1,764	61,839	59,502	223,555,142	208,323,630
Baltimore, Md	2,502	2,502	73,769	71,444	215,171,530	186,977,710
Cincinnati, Ohio	2,135	2,184	59,861	60,192	210,860,386	192,515,692
Newark, N. J	2,275	1,858	63,084	59,955	210,601,047	202,511,520
Minneapolis, Minn	1,349	1,102	28,295	26,962	187,854,159	165,404,680
Jersey City, N. J	770	745	31,021	25,454	164,528,608	128,774,978
San Francisco, Calif	2,334	1,796	31,758	28,244	162,299,795	133,041,069
Kansas City, Kans	201	165	13,095	12,294	159,700,168	164,080,607
Perth Amboy, N. J	128	80	9,202	5,866	148,959,944	118,598,096
Rochester, N. Y	1,244	1,203	44,113	39,108	140,696,682	112,676,215
Indianapolis, Ind	886	855	30,971	31,815	139,700,016	126,522,113
Akron, Ohio	305	246	24,680	15,831	122,291,600	73,158,206
Providence, R. I	1,207	1,080	44,176	46,381	115,335,131	120,240,584
Toledo, Ohio	713	760	27,076	18,878	115,049,426	61,229,542
South Omaha, Nebr	61	71	6,063	6,306	106,025,436	92,435,712
Louisville, Ky	778	903	25,930	27,023	105,222,671	101,283,955
Total	81,078	74,705	2,216,116	2,076,751	$8,935,940,288	$7,797,877,153

THE AUTOMOBILE INDUSTRY

	1914			1909	Per Cent. of Increase, 1909–1914
	Automobiles	Automobile Bodies and Parts	Total		
Number of establishments [1]	300	971	1,271	743	71.1
Persons engaged in manufacture:	91,997	53,954	145,951	85,359	71.0
Proprietors and firm members	60	700	760	405	87.7
Salaried employees	12,630	5,469	18,099	9,233	96.0
Wage earners (average number)	79,307	47,785	127,092	75,721	67.8
Primary horsepower	104,983	68,701	173,684	75,550	129.9
Capital	$312,876,000	$94,854,000	$407,730,000	$173,837,000	134.5
Services	84,901,000	54,552,000	139,453,000	58,173,000	139.7
Salaries	17,966,000	19,560,000	37,526,000	9,479,000	295.9
Wages	66,934,000	34,993,000	101,927,000	48,694,000	109.3
Materials	292,598,000	63,610,000	356,208,000	131,646,000	170.6
Value of products	503,230,000	129,601,000	632,831,000	249,202,000	153.9
Value added by manufacture (value of products less cost of materials)	210,632,000	65,991,000	276,623,000	117,556,000	135.3

[1] In addition, in 1914, 33 establishments primarily engaged in other lines of manufacture, produced automobiles to the value of $6,636,920, and 434 establishments of this character manufactured automobile bodies and parts to the value of $10,515,070; in 1909, similar establishments produced automobiles valued at $830,080 and automobile bodies and parts valued at $4,415,266.

products of the boot and shoe industry were valued at $590,000,000, and of this, $255,000,000, or 43.2 per cent., was produced by the establishments in Massachusetts. The manufacture of artificial flowers and feathers and plumes is largely concentrated in New York City, where 85.8 per cent. of the domestic products are manufactured. The manufacture of brass, bronze, and copper products, clocks, and needles and pins are localized in Connecticut, as the establishments in that state reported 42.8, 41.0, and 64.7 per cent., respectively, of these products for 1914. New York City reported 71.7 per cent. of the ready-made women's and 34.7 per cent. of the men's clothing manufactured. The collar and cuff factories in Troy, N. Y., manufactured 90.1 per cent. of the products for 1914. The manufacture of fountain and stylographic pens and tobacco pipes is also confined to New York City, where 68.9 and 62.2 per cent. of the products were manufactured in 1914. The cleaning and polishing of rice is localized in Louisiana and Texas, as these states control 87.6 per cent. of the products. A similar, though not so marked, concentration is shown for a number of other industries.

Manufactures in Cities.—The extent of the concentration in the principal manufacturing cities is shown by the statement on the preceding page, in which the 25 cities reporting the largest product in 1914 are arranged in the order of their importance, as measured by the value. These cities contain 29.4 per cent. of the establishments, gave employment to 31.5 per cent. of the wage earners, and their products formed 36.9 per cent. of the total products for the entire United States in 1914.

Basic Industries.—Conditions during the year called special attention to the metal and textile industries and the manufacture of food products and of explosives. While operations in other branches of manufacture, such as the wood-working industries, leather, and chemicals, assumed large proportions, the demands for war munitions stimulated especially the four groups of industry from which they are principally derived.

In 1914 there were 286 furnaces in blast, and the annual production amounted to 23,269,731 tons of pig iron. In December, 1915, there were 310 furnaces in operation, and the production for the last half of the year amounted to 17,682,422 tons, indicating an annual production of over 35,000,000 tons, or an excess of 12,000,000 tons over 1914. The products of the steel works, fabricated metal, amounted to 25,522,784 tons in 1914. The exports of these products for the first eight months of 1914 and 1916 were valued at $23,061,000, and $130,105,000, respectively. The year 1914 was one of great industrial depression

in these industries. The production was considerably less than for a number of years. The value of all the products of the blast furnaces was placed at $318,000,000, while for 1909 it was $391,000,000. The products of the steel works amounted to $919,000,000, as compared with $986,000,000 in 1909. The production for 1916, therefore, was phenomenal, and carried along with it a majority of the industries that use metals as raw material.

Automobiles.—Of the industries dependent upon the production of metal, special attention is directed to the manufacture of automobiles, general statistics of which are given in the table at the top of the preceding page. The development of the automobile has been one of the industrial wonders of the age. There are now approximately 2,000,000 automobiles registered in the United States, and the reports of the manufacturers indicate that the production for 1916 will amount to 1,500,000. The exports of automobiles and parts during the first eight months of 1916 were valued at $79,867,229, while for the corresponding period of 1914 they amounted to $21,491,862. (See also XXI, *Automobiles.*)

Electrical Machinery.—The demand for electrical equipment of automobiles was only one of the minor factors that has stimulated the manufacture of electrical apparatus and supplies. The production for 1914, which could probably be considered a normal year, was valued at $360,000,000. The number, variety, and scientific accuracy of the machinery and supplies used for electrical purposes has increased enormously during the past 20 years. The scientific precision required has tended to specialization, and the industry is now one of the most highly specialized. The table on the following page shows the value of products in 1909 and 1914.

Brass, Bronze, and Copper Products.—The development of the electrical industries and the consumption of copper in the manufacture of war supplies are the principal factors that have stimulated the production of copper and copper alloys. The production of refined copper during 1915 amounted to 1,634,000,000 lb., and the exports for the first eight months of 1916 were valued at $133,728,770, as compared with $70,182,734 for the corresponding period of 1915. The following table gives the principal statistics of manufactured products in 1914:

Products	Total	Brass and Bronze	Copper	Other
Total	$231,205,715	$131,495,148	$82,841,246	$16,869,321
Ingots and bars	8,819,571	7,460,396	1,357,804	1,371
Plates and sheets	43,019,997	25,928,193	13,638,770	3,453,034
Rods	14,569,759	8,277,388	6,220,067	72,304
Tubing	13,934,641	10,131,975	3,613,370	189,296
Seamless	10,273,755	6,967,813	3,119,458	186,484
Brazed	3,660,886	3,164,162	493,912	2,812
Wire	60,069,738	5,851,670	52,940,097	1,277,971
Plain	44,360,456	5,851,670	[1] 37,230,815	1,277,971
Insulated	15,709,282	.....	15,709,282	.....
Other manufactured products	85,149,396	73,845,526	5,071,138	[2] 6,232,732
All other products	5,642,613	.....	.....	[3] 5,642,613

[1] Includes $13,966,315 estimated value of 23,458 tons manufactured and consumed in establishments engaged in the manufacture of electrical machinery.
[2] Includes aluminium castings to the value of $6,101,198.
[3] Includes amounts received for contract or custom work and value of some products made from metals other than brass, bronze, copper, German silver, or aluminium.

Cotton.—Unusual activity characterized practically all branches of the textile industry throughout the year. As a rule, the mills were overcrowded with business. Both the foreign and domestic demand for practically all the textile products increased rapidly, but interest was largely centered on the manufacture of cotton goods. There was a phenomenal increase in the price of raw cotton, which during October sold as high as 20 cents per pound. That the prosperous condition was due in part to the foreign demand was evident from the fact that the exports of raw cotton during the first eight months of 1916 amounted to 4,194,056 bales, as compared with

THE ELECTRICAL MANUFACTURING INDUSTRY

	1914 [1]	1909 [1]	Per Cent. of Increase, [2] 1909–1914
Number of establishments	1,121	1,151	−2.6
Value of products, total	$359,432,155	$240,037,479	49.7
Dynamos	23,233,437	17,231,804	34.8
Transformers	13,120,065	8,801,019	49.1
Rheostats, resistances, controllers, motor-starting and speed-controlling devices, feeder-potential regulators, and reactances	9,543,224	[3] 2,674,963	....
Generator-voltage regulators	245,154	[4]	....
Rectifying apparatus (including rotating commutators, electric valves, mercury rectifiers, and vibrating commutators)	147,965	[4]	....
Switchboards, panel boards, and cutout cabinets for light and power	8,989,111	5,971,804	50.5
Motors	44,176,235	32,087,482	37.7
Batteries, parts, and supplies	23,402,455	10,612,470	120.5
Carbons (including furnace, lighting, brushes, battery, and miscellaneous)	3,602,741	1,934,864	86.2
Arc lamps	742,142	1,706,959	−56.5
Searchlights, projectors, and focusing lamps	2,081,545	935,874	122.4
Incandescent lamps	17,350,385	15,714,809	10.4
Sockets, receptacles, bases, etc	5,512,609	4,521,729	21.9
Electric lighting fixtures [5]	3,383,955	2,200,668	53.8
Telegraph apparatus	2,248,375	1,957,432	14.9
Telephone apparatus	22,815,640	14,259,357	60.0
Electric heating apparatus	4,048,915	1,954,112	106.5
Electric measuring instruments	8,786,506	7,800,010	12.6
Electric locomotives, mine and railway	3,720,914	[4]	....
Electrical therapeutic apparatus	2,653,098	1,107,858	139.5
Magneto-ignition apparatus, sparks, coils, etc	22,260,847	6,092,343	265.4
Electric switches, signals, and attachments	6,393,551	5,377,843	18.9
Annunciators	263,806	235,567	12.0
Electric clocks and time mechanisms	410,774	352,513	16.5
Insulated wire and cables [6]	69,505,573	51,624,737	34.6
Electric conduits (underground and interior)	4,874,709	5,098,264	−4.4
Lightning arresters	1,188,773	940,171	26.4
Fuses	1,757,430	1,001,719	75.4
Circuit fittings of all kinds	2,067,683	1,080,287	91.4
All other electrical machinery, apparatus, and supplies	27,276,294	18,995,176	43.6
All other products, including amount received for custom work and repairing	23,623,244	17,765,645	33.0

[1] Includes, for 1914, number and output of 91 establishments engaged primarily in other lines of industry, but which manufactured electrical machinery, apparatus, and supplies valued at $24,261,961; and for 1909, number and output of 142 similar establishments which made electrical machinery, apparatus, and supplies to the value of $18,728,916.

[2] A minus sign (—) denotes decrease.

[3] Rheostats and resistances only.

[4] Figures not available.

[5] Not including fixtures made by establishments engaged primarily in the manufacture of gas and electric fixtures.

[6] Includes insulated wire made in wire-drawing mills.

6,099,458 and 3,734,531 bales during the corresponding months of 1915 and 1914, respectively. The exports of cotton manufactures for the same period of 1916 were valued at $84,339,352, as compared with $62,491,779 and $30,428,405 for 1915 and 1914. (See also XIII, *Economic Conditions.*)

With the exception of July, the monthly domestic consumption of cotton was greatly in excess of that for the corresponding periods, month by month, for any year since 1913. The largest monthly consumption was reported for March, when it reached 613,754 bales. By the close of the year there were in the United States 32,805,883 active spindles. This was an excess of 841,648 over the number reported as active during 1915, and more than twice as great as the number in 1890. A striking feature of the development of the industry has been its increase in the southern states. In 1880 there were only 561,360 cotton spindles in the South, and they consumed 188,748 bales during the year. In 1916 there were 13,382,065 spindles in operation and they consumed 3,977,130 bales. Between 1900 and 1916 the annual consumption increased 161.2 per cent., while in the New England states it increased 37.6 per cent.

THE TEXTILE INDUSTRY, 1914

	Cotton Manufactures [1]	Wool Manufactures [2]	Silk Goods	Hosiery and Knit Goods	Cordage and Twine, and Jute and Linen Goods	Wool Shoddy
Number of establishments	1,328	979	902	1,622	160	64
Persons engaged	403,911	203,716	115,571	159,673	28,909	2,391
Proprietors and firm members	489	578	591	1,298	57	58
Salaried employees	10,018	7,853	6,810	7,855	1,529	188
Wage earners (average number)	393,404	195,285	108,170	150,520	27,323	2,145
Primary horsepower	1,585,953	442,330	116,924	125,842	93,937	12,440
Capital	$899,764,682	$497,699,293	$210,071,679	$215,826,340	$98,561,044	$6,420,985
Salaries and wages	169,822,599	108,009,668	57,615,374	71,039,186	13,886,970	1,343,171
Salaries	17,400,000	14,651,788	10,506,905	11,281,035	2,445,247	287,057
Wages	152,422,599	93,357,880	47,108,469	59,758,151	11,441,723	1,056,114
Paid for contract work	1,614,636	2,456,260	14,550,762	3,239,695	21,810	1,570
Rent and taxes	8,409,837	3,922,866	2,031,897	2,355,597	701,740	65,757
Cost of materials	443,522,515	298,063,498	144,442,321	146,687,458	60,474,417	5,299,903
Value of products	701,300,933	464,249,813	254,011,257	238,912,903	83,235,068	7,706,843
Value added by manufacture	257,778,418	166,186,315	109,568,936	112,225,445	22,760,651	2,406,940

[1] Includes cotton goods, cotton small wares, and cotton lace.
[2] Includes woolen goods, worsted goods, carpets and rugs (other than rag), felt goods, and wool-felt hats.

During each of the past five years the factories in the South have reported a greater consumption than the mills in all the other states combined. The excess was greatest during 1916, when it amounted to 1,349,980 bales. The southern mills now operate 40.7 per cent. of the spindles in the country.

There were 1,324 cotton factories in operation in the United States in 1909, and 1,328 in 1914. Of these, 108 made a specialty of small wares, such as shoe and corset lacings, wicks, tape, webbing, and lace edgings. There were 7,000 persons engaged in these factories, and the salary and wage payments for 1914 amounted to $3,463,783; the products were valued at $11,525,033. There were 41 factories that manufactured cotton lace. This branch of the cotton industry has developed in the United States during the past ten years, and the annual production now exceeds $13,000,000. The following table shows the values of the principal products of cotton manufacture in 1914 and 1909:

Products	1914	1909
Total value.	[1] $701,300,933	$628,391,813
Woven goods	$488,728,054	$447,167,319
Ducks	47,921,989	27,485,892
Ginghams	36,706,542	37,939,040
Fancy weaves, total	129,695,313	126,873,133
Drills	21,256,698	17,750,151
Twills, sateens etc.	32,891,854	34,274,107
All other fancy weaves	75,546,761	74,848,875
Napped fabrics	24,352,020	25,695,367
Velvets, corduroys, plushes, etc.	8,540,143	6,965,634
Toweling and terry weaves	9,805,232	6,037,075
Mosquito netting and similar fabrics	2,820,524	2,103,560
Bags and bagging	9,705,616	4,862,451
Tapestries	5,411,592	4,723,907
All other woven goods	213,769,083	204,481,260
Yarns manufactured for sale	127,363,952	109,314,953
Thread	22,917,099	20,516,269
Twine	2,792,125	2,417,391
Cordage and rope	891,223	1,164,526
Cotton waste not used	14,421,929	10,874,386
All other products	44,186,551	36,936,969

[1] In addition, cotton goods to the value of $12,689,741 were produced in 1914 by establishments engaged primarily in other lines of industry.

THE EXPLOSIVES INDUSTRY

	1914	1909	Per Cent. of Increase [1] 1909–1914
Number of establishments	111	86	29.1
Persons engaged in manufacture	8,425	7,058	19.4
Proprietors and firm members	20	21	−4.8
Salaried employees	2,099	763	175.1
Wage earners (average number)	6,306	6,274	0.5
Primary horsepower	45,778	28,601	60.1
Capital	$71,351,414	$50,167,976	42.2
Services	7,795,623	5,437,976	43.4
Salaries	3,307,335	1,133,606	191.8
Wages	4,488,288	4,304,370	4.3
Materials	25,626,539	22,811,548	12.3
Value of products	41,432,970	40,139,661	3.2
Dynamite	120,553,653	20,998,820	10.0
Permissible explosives	1,604,072	863,209	85.8
Nitroglycerin	950,611	863,360	−72.6
Blasting powder	8,459,113	9,608,265	−11.2
Gunpowder	977,455	1,736,427	−43.7
Other explosives (including smokeless powder and guncotton or pyroxylin sold as such)	7,100,478	3,913,787	81.7
All other products	1,787,588	2,155,793	−16.6
Value added by manufacture (value of products less cost of materials)	15,806,431	17,328,113	−8.8

[1] A minus sign (−) denotes a decrease.

Manufacture of Explosives.—The continued manufacture of explosives on a large scale for export was one of the leading features in the industrial activity of the year. The operations during 1914, which are reflected by the statistics in the accompanying statement, are no indication of the magnitude of the industry in 1916. The exports of explosives in the first eight months of 1914 were valued at $4,142,725; for the corresponding period of 1915 they amounted to $65,911,906, and of 1916 to $459,100,368 (*see also XX, External Commerce*).

Consumption of Cotton in the Manufacture of Explosives.—A law approved on Aug. 7, 1916, requires the Census Bureau to collect statistics of raw and prepared cotton and linters, cotton waste, and hull fiber consumed in the manufacture of guncotton and explosives of all kinds. The phenomenal increase in the manufacture of explosives had directed attention to the fact that large quantities of cotton, especially linters, were being used, and it was believed that the quantities were sufficient to affect the price. The investigation showed that there were 25 establishments that used cotton in some form to manufacture explosives. Some of these were very small concerns and used comparatively little cotton; only six or eight manufactured for the export trade. In all there were 240,003 bales used during 1915 and 287,713 bales in the first half of 1916. A few of the manufacturers bleach all or a part of the fiber they use, but the general practice is to purchase the cotton already prepared. The exports of linters during the first eight months of 1916 amounted to 276,351 bales. It is fair to assume that practically all of the exports are used in the explosive industry.

Food Products.—The manufacture of animal and vegetable food products and the canning and preserving of meats, fish, oysters, fruits and vegetables were carried on in 1914 by 59,317 establishments, and the annual products amounted to $4,816,709,664. The canning industry is one of the principal branches of the manufacture, and the variety as well as the quantity of the products has increased rapidly. The production, shown in the following table, now places the canning industry among the most important in the country:

Product	Number of Cases	Value
Fish and oysters	12,844,757	$41,321,593
Fruits	11,690,703	30,175,174
Milk (condensed)	18,196,052	58,747,252
Meat	5,955,516	26,417,624
Sausage	2,846,322	9,845,669
Soups	4,886,098	7,877,057
Vegetables	50,258,674	84,413,667

PATENTS AND INVENTIONS

WALTER F. ROGERS

Patent Legislation.—It has been the custom of some advertising concerns to issue circulars and pamphlets bearing photographs of Senators and Representatives and commendatory letters from them in juxtaposition with flamboyant advertising intended to lure the public into invention by promises of great rewards. The Commissioner of Patents succeeded during the year in persuading Congress to pass an act, approved April 27, 1916, forbidding the use of the names of members of Congress in any such connection.

An amendment to Section 4984 of the Revised Statutes, approved July 6, 1916, adds a proviso "that no application shall be regarded as abandoned which has become the property of the Government of the United States and with respect to which the head of any department of the Government shall have certified to the Commissioner of Patents, within a period of three years, that the invention disclosed therein is important to the armament or defense of the United States," and requires the Commissioner to notify the head of the department of the expiration of any such term.

An act approved Aug. 17, 1916, extends the time (in view of the war) for filing applications and fees by citizens of nations which extend substantially similar privileges to citizens of the United States, the time running from Aug. 1, 1914, to Jan. 1, 1918.

By order of Oct. 18, 1916, the rules governing motions to dissolve in trademark cases were brought into conformity with the rules relating to similar motions in patent cases.

The patent legislation known as the "Oldfield Revision," proposed in 1912 (*A. Y. B.*, 1913, p. 541) and actively debated for some time thereafter, has made no progress during the last two years. The principal subject before the committees of Congress during 1916 has been the proposed Designs bill, providing for registration instead of patenting. This bill, approved broadly by the Commissioner of Patents, has been opposed principally upon some details.

During the year there was published a revision of the "Rules of Practice," following an elaborate study by a committee of Patent Office officials and a representative of the patent bar.

The Patent Office.—The Department of the Interior is constructing a new building in Washington and it is the expectation that when it is finished the Patent Office will have practically all of the building so designated, as well as the building formerly known as the Post Office Building, directly opposite the Patent Office. This promises to make much needed room for the enormous accumulation of files.

Approximately 44,000 patents were granted in the fiscal year 1916, the total number of patents at the end of the fiscal year being 1,210,387. Applications received in the year, including re-issues, designs, trademarks, labels and prints, numbered over 80,000. The number of applications awaiting action has decreased, being now considerably over 10,000 less than two years ago. During the year some 21,000 patents have expired and are now free to the public. The receipts of the Patent Office for the year were nearly two and a half millions, leaving a surplus for the year of about a quarter of a million. In the past 10 years the increase in receipts has been approximately half a million. About 215,000 amendments were filed during the year and nearly 290,000 miscellaneous pieces of correspondence were received and indexed. Two and three-quarter million copies of patents were sold, for which the Office received nearly $130,000. In addition to this, considerably over a million copies of patents were shipped to foreign countries. The Patent Office recorded nearly 32,000 deeds of assignment. Copies of records aggregating nearly 30 million words were supplied, bringing in a revenue of about $30,000, and nearly 73,000 copies of photographs of drawings, etc., were supplied to fill orders.

XX. TRADE, TRANSPORTATION, AND COMMUNICATION

GROVER G. HUEBNER and ROBERT RIEGEL

MERCHANT MARINE

Tonnage Afloat.—Official figures for the year ending June 30, 1915, show a slight decrease of 0.8 per cent. in the number, and an increase of 5.8 per cent. in the tonnage, of the documented merchant vessels of the United States as compared with the preceding fiscal year. The number of vessels decreased from 26,943 to 26,701, while the tonnage grew from 7,928,688 to 8,389,429, the greatest absolute increase in tonnage in our history. The decline in the number of vessels would have been greater had it not been for an increase of 389 vessels registered for the foreign trade, which division of tonnage was almost entirely responsible for the increase in total tonnage. Enrolled vessels and licensed vessels showed declines in number and tonnage. This is not only a continuation of the tendency noted in 1912, 1913 and 1914, when registered vessels were also mainly responsible for the growth of our merchant marine, but results also from the transfer of coastwise vessels to the lucrative North-Atlantic trade. The total of 1,871,543 tons of registered shipping on June 30, 1915, exceeds that for any of the past 29 years, and the increase in registered shipping during 1915 is three times as great as in the previous record year. The following table shows the course of the documented marine since 1880:

Year ending June 30	Registered Vessels		Enrolled Vessels		Licensed Vessels under 20 Tons		Total Documented Merchant Marine	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
1880....	2,378	1,352,810	16,410	2,649,353	5,924	65,871	24,712	4,068,034
1890....	1,527	946,695	15,063	3,391,884	6,877	85,918	23,467	4,424,497
1895....	1,260	838,187	14,408	3,705,104	7,572	92,669	23,240	4,635,960
1900....	1,330	826,694	13,786	4,239,569	8,217	98,576	23,333	5,164,839
1905....	1,372	954,513	14,126	5,391,802	9,183	110,228	24,681	6,456,543
1910....	1,526	791,825	14,049	6,593,728	10,165	122,529	25,740	7,508,082
1911....	1,703	872,671	13,933	6,640,820	10,355	125,299	25,991	7,638,790
1912....	2,012	932,101	13,912	6,652,686	10,604	129,396	26,528	7,714,183
1913....	2,305	1,027,776	14,001	6,726,340	10,764	132,402	27,070	7,886,518
1914....	2,405	1,076,152	13,836	6,718,974	10,702	133,562	26,943	7,928,688
1915....	2,794	1,871,543	13,348	6,384,725	10,559	133,161	26,701	8,389,429

Of the total registered, enrolled and licensed gross tonnage operating under the American flag on June 30, 1915, steamers contributed 68.9 per cent., sailing vessels 16.5 per cent., barges and canal boats 12.7 per cent., and motor boats (separately classified in 1915 for the first time) 1.9 per cent.

Statistics published by the Commissioner of Navigation in December indicate that the documented merchant marine in the foreign trade under the flag of the United States aggregated 2,191,715 tons on June 30, 1916, and that the entire documented merchant marine in the United States increased to 8,469,649 tons during the last fiscal year. The increase was limited entirely to the foreign trade. The tonnage engaged in the domestic trade on the Great Lakes declined to 2,760,815, and that engaged in the coastwise trade and the trade on the inland waterways declined to 3,517,119 tons. These figures show that while the total documented merchant marine of the country increased by 540,961 gross tons since the beginning of the European War, our shipping in the foreign trade alone increased by 1,115,563 gross tons.

Undocumented Craft.—The above figures do not include many undocumented vessels, of which no reliable recent statistics are available, no count having been made since the 1906 census report, which showed 19,497 such vessels with a gross tonnage of 6,579,402 tons. Detailed figures were given in the YEAR BOOK for 1910 (p. 523).

Geographical Distribution.—The Atlantic-Gulf coast, which was an important factor in the increase of documented tonnage in 1913 and 1914, was almost entirely responsible for the gain in 1915, contributing 500,363 tons. The tonnage on this coast, which comprised about 48 per cent. of the total tonnage in 1914, in 1915 had grown to over 51 per cent. of the total. Pacific coast tonnage, which expanded by 56,090 tons in 1914, increased by only 24,619 tons in 1915. Porto Rico showed a gain of 6,279 tons, while Hawaii, the northern lakes, and western rivers showed decreases. The distribution of vessels and tonnage on June 30, 1915, was:

	Sailing Vessels		Steam Vessels		Motor Vessels		Canal Boats and Barges		Total	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Atlantic and Gulf	5,117	931,588	3,539	2,489,584	5,126	84,312	2,809	790,401	16,591	4,295,885
Porto Rico	80	8,538	9	5,400	11	173	.....	.....	100	14,111
Pacific Coast	443	251,845	1,036	683,879	2,178	50,478	1,315	123,057	4,972	1,109,259
Hawaii	4	1,503	21	11,152	19	706	.....	.....	44	13,361
Northern Lakes	220	190,928	1,615	2,478,043	733	9,902	593	139,136	3,161	2,818,009
Western Rivers	2	72	732	113,358	929	16,823	170	8,551	1,833	138,804
Total	5,866	1,384,474	6,952	5,781,416	8,996	162,394	4,887	1,061,145	26,701	8,389,429

The following table shows the distribution of the aggregate documented tonnage among the leading customs districts in 1914 and 1915:

Customs Districts	1914	1915
Boston	286,206	243,726
New York	1,806,742	2,231,963
Philadelphia	323,311	318,364
Baltimore	250,075	235,517
San Francisco	540,428	570,681
Seattle	351,939	345,040
Buffalo	286,215	296,345
Detroit	201,683	198,958
Chicago	123,610	109,333
Duluth	937,374	921,634

World's Merchant Marine.—The aggregate tonnage of the merchant vessels of the entire world in 1916 was reported by *Lloyd's Register* to be 48,683,136 tons (30,167 vessels), as compared with 49,261,769 tons (30,720 vessels) in 1915, 49,089,552 tons in 1914, 46,970,113 tons in 1913, 44,600,677 tons in 1912 and 43,147,154 in 1911. These figures, it should be noted, are not exact, because they include only vessels exceeding 100 tons, because they comprise the gross tonnage of steamers and the net tonnage of sailing vessels, and because the tonnage is stated in accordance with official certificates based on widely varying measurement rules. The number and gross tonnage of steam vessels of the world, as reported in *Lloyd's Register*, are given in the table on the following page.

A compilation of the New York *Journal of Commerce* shows that from the beginning of the war to the end of 1915 about 990 vessels, aggregating 1,878,003 gross tons, were lost; and during 21 months of war preceding May 1, 1916, at least 1,216 vessels of 16 different nations, aggregating 2,462,259 gross tons. Of the latter total Allied shipping contributed 1,917,161 tons, or 78 per cent.; Teutonic shipping 196,396 tons, or 8 per cent.; and neutral shipping 348,702 tons, or 14 per cent. The detailed figures indicate that the rate of destruction increased during the first four months of 1916. In April, 1916, an average of 52,125 tons a week was destroyed.

Relative Position of American Deep-Sea Shipping.—The effects of the European War on American exports, the shortage in ocean tonnage, the rise in commodity prices, and the transfer of vessels to American registry are all reflected in the 1915 figures showing American and foreign carriage of imports and exports by sea.

THE WORLD'S MERCHANT MARINE, STEAM VESSELS ONLY

Flag	1900		1915		1916	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
American:						
Sea[1]	690	878,564	1,294	2,623,674	1,343	2,890,315
Lakes	242	576,402	569	2,231,074	561	2,225,900
Austro-Hungarian	214	387,471	422	1,016,695	385	891,103
British	7,903	12,149,090	10,218	20,830,918	10,030	20,463,881
Danish	369	412,273	586	803,701	589	797,371
Dutch	289	467,209	710	1,498,519	697	1,486,368
French	662	1,052,193	1,016	1,909,609	998	1,851,120
German	1,209	2,159,919	1,897	4,419,167	1,708	3,890,542
Italian	312	540,349	655	1,513,631	684	1,685,720
Japanese	484	488,187	1,155	1,826,068	1,151	1,847,453
Norwegian	806	764,683	1,658	1,977,809	1,795	2,263,900
Russian	.....	.....	744	851,951	753	875,146
Spanish	422	642,231	588	885,755	552	815,166
Swedish	678	418,550	1,090	1,021,796	1,037	926,650
Other countries	1,591	1,432,237	1,906	2,318,841	1,849	2,337,089
Total	15,898	22,369,358	24,508	45,729,208	24,132	45,247,724

[1] Includes Philippine Islands.

During the year there was an absolute increase of $203,572,156 in the value of goods transported in American vessels and a relative increase in goods so transported from 9.7 to 14.3 per cent. of the total value of goods shipped and received by water. This is the largest proportion of imports and exports carried by American vessels since 1889. The value of goods carried in cars and other land vehicles, which has increased annually since 1909 (with the exception of 1914), declined in 1915 by $22,902,688, or 4.8 per cent. The following table shows the position of the American merchant marine in the carrying trade since 1821:

AMERICAN VESSELS IN THE FOREIGN TRADE

Year	Total Imports and Exports				
	In Cars and Other Land Vehicles	By Sea			Per Cent. in American Vessels
		American Vessels	Foreign Vessels	Total	
1821	.....	$113,201,462	$14,358,235	$127,559,697	88.7
1826	.....	150,331,636	12,238,163	162,569,799	92.5
1840	.....	198,424,609	40,802,856	239,227,465	82.9
1860	.....	507,247,757	255,040,793	762,288,550	66.5
1880	$20,981,393	258,346,577	1,224,265,434	1,482,612,011	17.4
1900	154,895,650	195,084,192	1,894,444,424	2,089,528,616	9.3
1905	242,265,329	290,607,946	2,103,201,462	2,393,809,408	12.1
1910	319,132,528	260,837,147	2,721,962,475	2,982,799,622	8.7
1911	365,903,334	280,206,464	2,930,436,506	3,210,642,970	8.7
1912	426,116,920	322,451,565	3,109,018,858	3,431,470,423	9.4
1913	505,831,459	381,032,496	3,392,028,429	3,773,060,925	10.0
1914	473,036,293	368,359,756	3,417,108,756	3,785,468,512	9.7
1915	450,133,605	571,931,912	3,420,693,563	3,992,625,475	14.3

Measured by the tonnage of vessels entered and cleared, also, American tonnage furnished a larger proportion than usual of the total deep-sea shipping. American vessels comprised 34.4 per cent. of the total tonnage of vessels entered and cleared at American ports during 1916, as compared with 28.5 per cent. in 1915 and 25.8 per cent. in 1914. This was not entirely due to a decline in available foreign tonnage as in 1915, for aside from the relative increase, American shipping underwent an absolute increase from 26,693,736 tons in 1915 to 35,808,975 tons in 1916. The following table contains the official figures of entrances and clearances of American and foreign vessels in the foreign trade since 1900:

ENTRANCES AND CLEARANCES IN THE FOREIGN TRADE

Year	Total Tonnage	Foreign		American	
		Tonnage	Per Cent.	Tonnage	Per Cent.
1900	56,444,146	44,099,576	78.0	12,344,570	22.0
1905	62,140,758	47,857,126	77.0	14,283,632	23.0
1910	79,941,664	62,244,602	78.0	17,697,062	22.0
1911	85,112,136	65,665,903	77.0	19,446,233	23.0
1912	92,574,983	69,614,418	75.0	22,960,565	25.0
1913	101,791,132	74,772,764	73.5	27,018,368	26.0
1914	106,571,986	79,101,283	74.2	27,470,703	25.8
1915	93,595,554	66,901,818	71.5	26,693,736	28.5
1916	103,996,268	68,187,293	65.6	35,808,975	34.4

Total Shipping in the Foreign Trade.—The total vessel tonnage entered and cleared in the foreign trade showed an increase of 10,400,714 tons in the year ending June 30, 1916. Even this increase of 11 per cent., however, did not bring the total up to the amount entered and cleared in 1914. Entrances increased from 46,710,466 tons in 1915 to 51,563,967 tons in 1916, and clearances from 46,885,008 tons in 1915 to 52,432,301 tons in 1916. The following table shows the tonnage entered and cleared by continents during the fiscal year 1916; comparison with the figures for 1915 shows the increase in tonnage to have been general for all continents:

	Entrances	Clearances
Europe	18,809,663	19,926,665
North America	27,117,599	26,957,198
South America	2,580,101	2,710,073
Asia	1,407,239	1,620,396
Oceania	605,490	753,876
Africa	1,043,875	464,093
Total	51,563,967	52,432,301

Tonnage Built.—Although the number of vessels constructed increased from 1,151 during 1914 to 1,157 in 1915, the total tonnage decreased from 316,250 gross tons to 225,122 gross tons, continuing the tendency evident in 1914. The output for the year 1915 is the smallest since 1898. The recent general tendency toward the construction of fewer vessels and these of greater individual tonnage, noted in previous issues of the YEAR BOOK, appears to have been halted, at least for a time. Nevertheless 23 vessels, or 1.9 per cent. of the total number constructed, furnished 57 per cent. of the total tonnage. The greater number of these were constructed on the Atlantic coast, the two largest being built for the Panama Canal administration and seven being bulk-oil carriers. Shipbuilding on the Great Lakes was at low ebb during the year 1915. The geographical distribution of the tonnage built in the United States in 1913, 1914 and 1915 was as follows:

	1913		1914		1915	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
Atlantic and Gulf coasts	597	202,394	554	215,141	540	171,422
Northern lakes	219	90,907	130	56,541	147	16,467
Pacific coast	409	44,589	330	36,420	318	31,601
Western rivers	234	7,930	132	8,009	144	5,499
Porto Rico	14	260	3	64	5	35
Hawaii	2	75	2	75	3	98
Total	1,475	346,155	1,151	316,250	1,157	225,122

Of the total of 225,122 tons constructed during 1915, 130,850 tons, or 58.1 per cent., were steel vessels, whereas in 1914, 205,431 tons, or 64.9 per cent. of the total, were of this nature. A large increase in the number of gasoline boats is to some extent responsible for the decline in relative importance of steel tonnage construction in 1915 as compared with 1914. While the number of sailing vessels constructed in 1915 equalled the number built in 1914, the sail tonnage continued to decline. In 1915,

of the total tonnage constructed, steamers comprised 142,449 tons; sailing vessels, 8,021 tons; barges, 57,654 tons; motor boats, 12,541 tons; and canal boats, 4,457 tons. The steam tonnage was relatively less important than for several years, forming only 63.2 per cent. of the total tonnage constructed, as compared with 71 per cent. in 1914, 70.3 per cent. in 1913 and 66 per cent. in 1912.

Since the above figures cover only the fiscal year ending June 30, 1915, they do not disclose the actual conditions recently existing in our seaboard shipyards. These are at present more fully occupied than at any time in recent history and the output for the current fiscal year will probably reach 400,000 tons. Owing to great inactivity on the Great Lakes, however, the output for the entire country probably will not equal that of the years 1901, 1902, 1907 and 1908, in each of which over 460,000 tons were built. Many orders are booked, however, which do not call for delivery until 1917 and later years. (See also XXI, *Naval Architecture.*)

Ship Subsidies and Mail Payments.—The net cost of the foreign mail service for the fiscal year 1915 was $3,074,875, as compared with $3,565,323 in 1914, $3,691,779 in 1913, $3,195,883 in 1912, and $3,315,349 in 1911. The year thus showed a decrease as compared with 1914 of $490,448, or 13.7 per cent. Five contracts were in force during the year under the provisions of the Mail Contract Act of March 3, 1891, and subsidies of $1,096,209 were paid, as compared with $1,089,361 in 1914, $1,144,630 in 1913, $983,160 in 1912, and $1,079,945 in 1911. Transatlantic services suffered by reason of the war, but the parcel-post service with Germany, Austria-Hungary, France and Italy, which had been suspended, was resumed. Service to Belgium is still suspended. All mails not carried under the ocean mail act of 1891 on the mileage basis are carried by non-contract vessels on the weight and postage basis.

The Shipping Act.—President Wilson signed on Sept. 7 the Shipping Act, creating a United States Shipping Board for the purpose of encouraging and developing a merchant marine and a naval auxiliary and for the regulation of shipping. The measure is a combination of the Ship Purchase bill of 1915 (*A. Y. B.*, 1915, p. 69) and the Alexander regulatory bill which has been before Congress since 1914 (*A. Y. B.*, 1914, p. 517). Its provisions by sections are briefly as follows (see also I, *The Sixty-Fourth Congress*):

(1) The United States Shipping Board is created, composed of five members appointed by the President, the term of office ultimately to be six years. Appointments are to be made with due regard to efficiency, and fair representation of various geographical divisions of the country, and not more than three members are to be of the same political party. None is to have any connection with any common carrier by water or to engage in any occupation other than that of commissioner. Members may be removed by the President for cause. The salary is $7,500 for commissioners and $5,000 for a secretary.

(2) The Board has the power to acquire vessels "suitable, as far as commercial requirements may permit, for use as naval auxiliaries," by construction, purchase, charter or lease. It may not acquire, however, vessels (*a*) now engaged in the foreign or domestic commerce of the United States, (*b*) under the registry or flag of a country engaged in war, (*c*) or less than 75 per cent. as efficient as when put in commission.

(3) The President may transfer to the Board, permanently or temporarily, War and Navy Department vessels suitable for commercial purposes and vessels of the Panama Railroad Co. not in use.

(4) The Board may sell, lease or charter any such vessels to citizens of the United States. Vessels becoming unfit for use are to be sold at public sale.

(5) Vessels purchased, chartered or leased from the Board may be registered, enrolled or licensed as United States vessels. Participation in the coastwise trade is permitted to vessels built abroad and enrolled under this Act, to vessels owned, chartered or leased by a corporation in which the United States is a stockholder, and to vessels sold, chartered or leased by the Board to citizens of the United States. No vessel purchased, chartered or leased from the Board shall be transferred to a foreign flag without the Board's consent.

(6) When the United States is at war or during a national emergency no vessels under the United States flag shall be sold, leased or chartered to any person not a citizen of the United States or placed under a foreign flag, without the consent of the Board.

(7) The President in emergency may take possession of vessels purchased, leased or chartered from the Board at their fair purchase or charter value.

(8) The Board may form one or more corporations for the purchase, lease,

charter and operation of such vessels as have been described, with a capital stock not to exceed $50,000,000. The Board shall control not less than 51 per cent. of the stock, and while it may sell stock, shall never become a minority stockholder. Vessels are to be operated, however, only if the Board is unable after a fair trial to sell, lease or charter such vessels to citizens of the United States. Vessels are to be offered for competitive bidding. Operation of vessels, as provided for by this section, must cease five years after the end of the European War, the stock of the corporation in the hands of the public may be taken over by the Board at a fair valuation, and the property of the corporation shall revert to the Board.

(9) The Board shall investigate the relative cost of shipbuilding here and abroad, the relative cost of operation of American and foreign vessels, measurement and rating rules, marine insurance and the navigation laws, and shall make recommendations to Congress on these subjects.

(10) No foreign or interstate carrier by water shall (*a*) pay or agree to pay deferred rebates to shippers; (*b*) use fighting ships for the purpose of excluding or reducing competition; (*c*) retaliate or discriminate against any shipper by the refusal of available space accommodations through unjust contracts or by other unfair methods.

(11) Carriers in foreign and interstate commerce and other persons subject to the Act (which term includes those in the business of forwarding or furnishing terminal facilities) shall file for approval with the Board a copy of any written and a memorandum of any oral arrangement to which it may be a party, regulating rates, special rates, privileges, competition, pooling or apportioning earnings or traffic, allotting ports, regulating sailings, regulating the volume or character of traffic to be carried, or providing for an exclusive preferential or coöperative working arrangement. Modifications and cancellations thereof are also to be filed.

(12) The Board is empowered to cancel or modify any such agreement or understanding, or part thereof, that it may find unfair as between carriers or exporters, or which operates to the detriment of United States commerce.

(13) Such agreements as are approved shall be exempted from the operation of the Sherman Act.

(14) It shall be unlawful for any common carrier by water or other persons subject to the act (*a*) to discriminate between persons by means of special rates, rebates or drawbacks; (*b*) to discriminate between persons, localities or kinds of traffic; (*c*) to falsely bill, classify or weigh; (*d*) to influence any marine-insurance company to prevent competing carriers by water from securing equitable rates on cargo carried.

(15) As regards common carriers engaged in foreign commerce, the Board is empowered to correct unjust discrimination in rates. It may also enforce just and reasonable regulations for the handling of property by any carrier.

(16) The Board has power to enforce among carriers by water engaged in interstate commerce reasonable maximum rates and also regulations affecting classifications, receipts, bills of lading, etc.

(17) Every common carrier by water engaged in interstate commerce shall file with the Board and keep open to public inspection the maximum rates over its own route and maximum rates over through routes, and must give ten days' notice of a change in rates. The Board is empowered to prescribe maximum rates and differentials between rail and water carriers when the two services are in competition with each other.

(18) When an interstate carrier reduces its rates with the intent of driving out competition it shall not be permitted to increase such rates unless justified by a change in conditions other than the elimination of said competition.

(19) All persons subject to the Act are prohibited from disclosing information received from shippers to competitors.

(20) As regards all persons subject to the Act, the Board may investigate unfair treatment of shippers regarding space accommodations, discriminating contracts, or unfair treatment in the handling of freight or settlement of claims. It may adopt rules necessary to prevent such practices.

(21) The Board may require any carrier to file periodically special reports of all business about which the Board is required by this Act to keep itself informed.

Panama Canal Traffic.—The traffic of the Panama Canal during the fiscal year ending June 30, 1916, was lighter than it had been in the previous year because, owing to severe slides in Gaillard Cut, the Canal was closed during the greater part of seven months (it was closed on Sept. 18, 1915, and remained closed for all shipping except small vessels until April 15, 1916); and, because many vessels that formerly operated through the Canal shifted to the lucrative trade of the North-Atlantic route, extending from our Atlantic and Gulf ports to such European ports as are open to ocean traffic. The number of vessels making the passage of the Canal in the fiscal year 1916 was 787, as compared with 1,088 in the 10½ months comprising the first fiscal year of operation. The net tonnage of the vessels using the canal in 1916 aggregated 2,479,761 tons, as compared with 3,843,035 tons in the preceding fiscal year. They carried 3,140,046 tons of cargo in 1916, compared with 4,969,792 tons in 1915. The monthly traffic statistics are given in the following table:

TRAFFIC OF THE PANAMA CANAL

Months	Eastbound		Westbound		Total Traffic		
	Vessels	Cargo (tons)	Vessels	Cargo (tons)	Vessels	Cargo (tons)	Net Tons
1915							
July	77	388,696	93	316,773	170	705,469	547,369
August	72	326,218	89	249,119	161	575,337	525,021
September	51	274,937	49	181,380	100	456,317	345,370
October	..	.....	..	.....	...	.....	.....
November	..	.....	..	.....	...	.....	.....
December	6	12,908	3	671	9	13,579	9,808
1916							
January	2	550	..	.....	2	550	600
February	1	.....	4	1,100	5	1,100	2,484
March	5	7,000	2	.....	7	7,000	11,808
April	48	224,620	32	144,133	80	368,753	242,684
May	60	245,861	69	248,289	129	494,150	394,543
June	54	225,020	70	292,771	124	517,791	400,044
Total for fiscal year 1916.	376	1,705,810	411	1,434,236	787	3,140,046	2,479,731
Total for fiscal year 1915.	558	2,844,057	530	2,125,735	1,088	4,969,792	3,843,035

The greatest decline in Panama Canal traffic has been in the coast-to-coast trade. Although this portion of the waterway's traffic was the only important part that was not abnormally depressed by the European War during the first fiscal year of operation, it has since all but ceased to exist. Nearly all vessels that were formerly engaged in the intercoastal trade have entered the European trade, being attracted by the unusually high ocean freight rates that prevail in this traffic. Other branches of traffic which have also declined since the fiscal year 1915 are the traffic between Europe and the west coast of North America, and that between Europe and the west coast of South America. The distribution of the Canal's traffic by routes during the first and last months of the fiscal year 1916 was as follows, the comparison of these months being preferable to the comparison of the fiscal years as a whole, because the returns for 1916 are influenced greatly by the extended suspension of traffic caused by the recurrence of slides (see also X, *Waterways and Harbors*):

Route	Atlantic to Pacific				Pacific to Atlantic			
	July, 1915		June, 1916		July, 1915		June, 1916	
	Vessels	Tons of Cargo	Vessels	Tons of Cargo	Vessels	Tons of Cargo	Vessels	Tons of Cargo
Coastwise	20	74,170	2	18,805	11	73,321	—	—
Europe—West Coast of North America	5	9,585	2	9,790	8	42,049	1	6,596
Europe—South America	4	11,155	3	9,414	14	108,010	5	27,521
United States—South and Central America	11	32,508	12	73,329	25	110,099	21	143,752
United States—Far East and Australasia	24	174,574	20	149,089	5	29,381	2	5,559
Atlantic terminus—South and Central America	10	9,816	19	23,455	8	8,366	19	28,528
Miscellaneous	1	4,965	1	8,492	5	17,470	2	13,064
Ballast	18	—	11	—	1	—	4	—
Total	93	316,773	70	292,771	77	388,696	54	225,020

The tolls collected from the vessels passing through the Panama Canal in the fiscal year 1916 amounted to $2,399,830. The amount expended on account of maintenance and operation was $6,999,750. This left an operating deficit of $4,599,920, although in the preceding year the tolls had exceeded current operating and maintenance costs by $220,256. In neither

year do these expense returns make any allowance for interest on the money invested in the Canal or for depreciation. The traffic of the year 1916 was unusually small, while its running expenses were large because they included the cost of dredging and otherwise keeping the Canal open.

EXTERNAL COMMERCE OF THE UNITED STATES

Total Foreign Trade.—Official figures for the fiscal year ending June 30, 1916, show the total value of imports and exports to have been $6,531,542,375, as compared with $4,442,759,080 in 1915, an increase of $2,088,783,295, or 47 per cent. Since June 30, 1914, our commerce with other nations has increased by more than half. The readjustment in American commerce caused by the European War in 1915 was accentuated during 1916. Exports, stimulated by the war, continued to expand more than imports, both actually and relatively. Thus, while in 1915 exports formed 62.3 per cent. of the total trade and imports 37.7 per cent., in 1916 exports aggregated $4,333,658,865, or 66.3 per cent. of the total, and imports $2,197,883,510, or 33.7 per cent. Exports to every continent showed a gain, with Europe naturally the leader in this respect. An increase in imports from every continent was likewise apparent, the greatest being in the North-American and Asiatic trades. Imports from Europe, as might be expected, were still several hundred million dollars below their usual figure. Nearly one-half of the total gain in our foreign trade as a whole is attributable to an increase of $1,027,748,742, or over 50 per cent., in exports to Europe. Of the increase of $2,088,783,295 in total foreign trade, only $396,865,385, or 18.9 per cent. of the gain, was attributable to trade with neutrals.

Exports to Foreign Countries.—While the 1915 increase in exports of over 17 per cent. was unparalleled in recent years, the figures for the fiscal year 1916 show an even greater gain. Their total value was $4,333,658,865, as compared with $2,768,589,340 in 1915, an increase of $1,565,069,525, or over 56 per cent. In the fiscal year 1914 exports declined four per cent.; since that time they have almost doubled. The exports of merchandise by continents for the four fiscal years 1913 to 1916 are given in the following table:

EXPORTS OF MERCHANDISE, BY CONTINENTS

Continent	1913	1914	1915	1916
Europe	$1,479,074,761	$1,486,498,729	$1,971,434,687	$2,999,183,429
North America	617,413,013	528,644,962	477,075,727	732,890,028
South America	146,147,993	124,539,909	99,323,957	180,356,555
Asia	115,056,620	113,425,616	114,470,493	278,470,228
Oceania	79,102,845	83,568,417	77,764,725	99,241,555
Africa	29,088,917	27,901,515	28,519,751	43,517,070
Total	$2,465,884,149	$2,364,579,148	$2,768,589,340	$4,333,658,865

Of the total increase in exports of $1,565,069,525, exports to Europe accounted for $1,027,748,742, or more than 65 per cent., but trade with South America, Asia and Africa also showed large gains. The larger part of the Asiatic increase, however, is to be traced to Asiatic Russia, and many of these shipments were probably destined for ultimate European consumption. Of the increase in total exports, over 70 per cent. is attributable to Great Britain, France, Canada and Italy. It is noticeable that a decline of 30 per cent. took place in our trade with the Netherlands, as a result of the British blockade (see III, *International Relations*). Our direct exports to Germany have become almost negligible, having declined from $28,863,354 to $288,851. Exports to South America, which showed a decline of $25,215,952 in 1915, increased from $99,323,957 in that year to $180,356,555 in 1916. This may be accounted for by the im-

provement in business conditions there and gradual adjustment to the changes in financing made necessary by the war. Merchandise exports to various important markets are shown in the table below:

EXPORTS OF MERCHANDISE, BY PRINCIPAL COUNTRIES

Market	1913	1914	1915	1916
Germany	$331,684,212	$344,794,276	$28,863,354	$288,851
Great Britain	597,149,059	594,271,863	911,794,954	1,518,046,263
France	146,100,201	159,818,924	369,397,170	630,672,504
Canada	415,449,457	344,716,981	300,686,812	466,884,415
Netherlands	125,909,862	112,215,673	143,267,019	99,232,930
Italy	76,285,278	74,235,012	184,819,688	270,489,922
Mexico	54,383,424	38,748,793	34,164,447	48,308,542
Belgium	66,845,462	61,219,894	20,662,315	21,844,638
Cuba	70,581,154	68,884,428	75,530,382	127,040,067
Argentina	52,894,834	45,179,089	32,549,606	65,993,611
Japan	57,741,815	51,205,520	41,517,780	75,098,188

In view of present conditions a comparison of the exports to the Entente Allies and their possessions and dependencies, to the Teutonic Allies and their possessions, and to neutral nations may be interesting. Exports to these groups for the past three years have been as follows:

	1914	1915	1916
Entente Allies	$1,460,147,814	$2,028,395,899	$3,505,773,718
Teutonic Allies	371,981,614	31,333,678	712,215
Neutrals	532,449,720	708,859,763	827,172,932
Total	$2,364,579,148	$2,768,589,340	$4,333,658,865

As will be seen from these figures, the exports to the Entente Allies and their possessions and dependencies comprised approximately 80 per cent. of our total export trade. As will be shown later, however, this must be regarded as very largely a temporary and not a permanent gain, owing to the character of the exports. Trade with the Teutonic Allies has declined from $371,981,614 in 1914 to the insignificant figure of $712,215. The increase in trade with neutral countries in 1915 continued during 1916.

As stated in the YEAR BOOK for 1915 (p. 528), the war has caused an extreme readjustment of the character of our exports. This consisted generally of enormous gains as regards certain commodities and classes of commodities, but some heavy losses are also to be noted in particular articles. Crude foodstuffs and food animals and manufactured foodstuffs, two items which furnished the greatest export increases in 1915, dropped back to approximately their normal position relative to other groups of commodities. The former comprised 18.7 per cent. of the total exports in 1915 and 8.9 per cent. in 1916. The latter group, manufactured foodstuffs, increased from $454,565,404 in 1915 to $596,071,882 in 1916, but formed only 13.9 per cent. of the total in 1916, as compared with 16.7 per cent. in 1915. Crude materials for use in manufacturing, while showing a small absolute gain, declined relatively from 18.8 per cent. of the total exports in 1915 to 12.6 per cent. in 1916. Manufactures for further use in manufacturing showed an increase of $306,687,509, and formed 15.5 per cent. of the aggregate exports, as compared with 13.1 per cent. in 1915. The most striking phenomenon of the export trade, however, was the reversal of the tendency of 1915 in manufactures ready for consumption, and an increase of $1,188,901,981 in this group. Finished manufactures in 1916 formed 46.7 per cent. of the total exports, but in 1915 comprised only 29.7 per cent. of the total. Miscellaneous merchandise accounted for 2.4 per cent. of the exports in 1916, as compared with 2.9 per cent. in 1915. Total exports of the various groups of commodities are shown in the following table (see also XIII, *Economic Conditions*, and XIX, *Manufactures*):

IMPORTS AND EXPORTS OF MERCHANDISE, BY CLASSES

Year Ended June 30	Foodstuffs in Crude Condition, and Food Animals	Foodstuffs Partly or Wholly Manufactured	Crude Materials for Use in Manufacturing	Manufactures for Further Use in Manufacturing	Manufactures Ready for Consumption	Miscellaneous	Total
Imports:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1900	97,916,293	133,027,374	276,241,152	134,222,045	203,126,341	5,407,979	849,941,184
1901	110,385,208	125,540,654	248,006,751	127,576,924	205,505,580	6,157,048	823,172,165
1902	120,280,302	95,350,256	303,001,868	147,656,292	231,420,820	5,611,410	903,320,948
1903	119,202,674	116,620,623	330,491,084	195,750,847	257,740,815	5,896,825	1,025,719,237
1904	132,223,895	118,222,862	320,794,431	160,233,890	252,812,835	6,754,620	991,087,371
1905	146,130,903	145,355,839	389,160,658	177,827,960	252,349,842	6,665,061	1,117,513,071
1906	134,322,347	140,358,109	414,687,999	220,298,751	307,674,728	9,100,980	1,226,562,446
1907	149,747,693	158,656,263	477,027,174	274,096,464	364,192,884	10,700,947	1,434,421,425
1908	145,577,427	147,008,870	363,823,723	196,320,135	331,204,635	10,406,902	1,194,341,792
1909	164,110,674	165,700,920	451,359,259	222,101,622	299,106,235	9,541,514	1,311,920,924
1910	144,776,636	181,566,572	566,270,770	285,138,373	367,723,367	11,471,712	1,556,947,430
1911	181,194,863	172,006,501	511,362,140	287,785,652	361,422,180	13,454,769	1,527,226,105
1912	230,358,230	196,100,608	555,986,041	293,739,134	360,018,963	17,061,958	1,653,264,934
1913	211,746,500	194,243,220	635,210,201	349,401,928	408,178,704	14,227,681	1,813,008,234
1914	247,947,621	227,644,329	632,865,860	319,275,488	449,318,214	16,874,145	1,893,925,657
1915	223,929,564	285,725,091	575,357,144	237,176,522	335,876,628	16,104,791	1,674,169,740
1916	251,833,794	309,708,717	944,105,228	359,441,501	315,353,634	17,440,636	2,197,883,510
Exports[1]							
1900	227,347,193	318,126,502	325,589,000	152,890,591	331,955,684	14,854,601	1,370,763,571
1901	246,394,140	336,605,378	397,767,463	148,013,625	317,764,367	13,917,833	1,460,462,806
1902	184,786,389	328,831,350	373,595,243	131,918,311	321,946,540	14,404,028	1,355,181,861
1903	185,308,064	323,244,697	408,442,137	140,666,864	327,468,629	7,100,911	1,392,231,302
1904	135,747,224	308,836,077	461,424,464	174,876,659	343,734,801	5,559,792	1,435,179,017
1905	118,185,098	283,065,098	472,114,493	209,926,174	402,049,798	6,403,980	1,491,744,641
1906	177,216,467	347,385,463	500,536,700	226,210,513	459,812,655	6,791,584	1,717,953,382
1907	167,348,227	345,706,609	593,145,135	259,442,028	480,681,423	7,394,612	1,853,718,034
1908	189,051,824	331,961,663	556,681,462	261,105,883	489,469,958	6,515,567	1,834,786,357
1909	135,693,409	302,555,341	520,907,436	231,186,607	440,229,407	7,783,393	1,638,355,593
1910	109,828,320	259,259,654	565,934,957	267,765,916	499,215,329	8,079,822	1,710,083,998
1911	103,401,553	282,016,883	713,018,206	309,151,989	598,367,852	7,592,542	2,013,549,025
1912	99,899,270	318,838,493	723,008,839	348,149,524	672,268,163	8,155,539	2,170,319,828
1913	181,907,266	321,204,373	731,758,513	408,806,949	776,297,360	8,531,897	2,428,506,358
1914	137,495,121	293,218,336	792,716,109	374,224,210	724,908,000	7,122,249	2,329,684,025
1915	507,003,179	454,565,404	510,455,540	355,862,329	807,465,511	80,826,502	2,716,178,465
1916	380,799,902	596,071,882	536,189,752	662,549,838	1,996,367,492	100,418,908	4,272,397,774

[1] Exports of domestic merchandise only.

As was stated in the YEAR BOOK for 1915 (p. 528) and is apparent from the table immediately following, the extraordinary increase in total exports for that year was principally due to the foodstuffs group, which furnished more than one-half of the total increase in export values. War munitions and munition material, while showing the extraordinary relative increases over 1914 of 515 per cent. and 172 per cent., respectively, contributed to the total comparatively insignificant absolute gains. With the close of the fiscal year 1915, however, these two latter items began to assume important proportions, and the year 1916 finds them together contributing $849,381,635 to the value of total exports. Exports of foodstuffs, on the other hand, while still of high value compared with previous years, increased only 2.7 per cent. over 1915. Breadstuffs, which gained greatly in 1915, actually declined in value, while a smaller increase in meat products than in 1915 was apparent. War supplies, including horses, mules, harness and saddles, aeroplanes, commercial automobiles, tires, wagons, gas and fuel-oil, barbed wire, horseshoes and surgical apparatus, increased only 40 per cent. in 1916, as compared with an increase of 484 per cent. in 1915. Hides, leather and manufactures thereof increased only 28 per cent., as compared with 99 per cent. in 1915, while forage exports declined in value from $78,356,631 to $67,159,091. Exports of all these commodities, however, are still far in excess of normal. Textile manufactures increased by 67 per cent. as compared with 76 per cent. in 1915. Exports developed by a state of war, therefore, classing as such the items and groups just mentioned, furnished in

1916 $880,130,467 out of a total export increase of $1,565,069,525, or 56 per cent., while in 1915 the gain in war exports, if they may be so termed, was double that of exports in general. In other words, a smaller proportion of our 1916 exports directly contributed to the European conflict. The following table shows the export values of the products mentioned in the years 1914, 1915 and 1916 and the percentage increases in 1915 and in 1916 over the preceding years:

	1914	1915	Per cent. Increase Over	1916	Per cent. Increase Over
	Value	Value	1914	Value	1915
Foodstuffs[1]	$429,955,930	$904,098,619	110.	$928,878,688	2.7
Munitions[2]	8,127,310	50,027,056	515.5	481,253,738	861.9
Materials for munitions[3]	35,161,828	95,853,257	172.6	368,127,887	284.0
War supplies[4]	28,993,373	169,519,826	484.6	237,939,002	40.3
Hides, leather and mfrs[5]	48,486,870	96,621,807	99.2	124,514,413	28.8
Forage[6]	12,592,173	78,356,631	522.2	67,159,091	—14.2
Textile manufactures[7]	56,257,320	99,301,948	76.5	166,036,782	67.2
Total	$619,574,804	$1,493,779,144	141.	$2,373,909,601	58.9

[1] Includes total foodstuffs except oats.
[2] Includes firearms and explosives, except dynamite.
[3] Includes zinc and zinc manufactures, lead and lead manufactures, brass and brass manufactures, iron rods, steel billets, metal-working machinery and sulphuric acid.
[4] Includes horses, mules, harness and saddles, aeroplanes, commercial automobiles, automobile tires, wagons, gas and fuel-oil, barbed wire, horseshoes, and surgical apparatus.
[5] Includes hides, sole leather, uppers, other leather, men's shoes and other manufactured leather.
[6] Includes hay, oats and oil-cake.
[7] Includes cotton manufactures and woolen manufactures.

While in 1915 the principal gains were recorded in materials used for purposes of war and many staple exports showed unusual declines, the year 1916 was of unexampled prosperity as far as exports in general were concerned. Practically every important commodity showed a gain as compared with 1915. The commodities principally used for military purposes have already been spoken of, and the remaining important items of our export trade may be divided into two classes. The first class comprises commodities which increased in value in 1916, but did not reach the figures attained in 1914, and includes the following:

	1914	1915	1916
Agricultural implements	$31,965,789	$10,304,978	$17,611,297
Fertilizers	11,978,738	3,870,887	5,343,497
Furs and fur skins	14,969,371	3,794,459	9,288,786
Naval stores	19,882,165	11,127,239	13,503,607
Tobacco, unmanufactured	53,963,670	44,493,829	53,163,595
Wood, and manufactures of	103,179,640	49,787,303	60,707,229

The second class comprises commodities which not only showed an increase in 1916, but which exceeded the figures of 1914, and includes:

	1914	1915	1916
Chemicals, drugs, dyes	$27,079,092	$46,380,986	$124,362,167
Coal, hard and soft	59,921,013	55,906,140	65,958,275
Copper manufactures	146,222,556	99,558,030	173,946,226
Fruits and nuts	31,850,392	34,933,117	36,965,328
India-rubber manufactures	12,441,220	14,767,513	35,180,096
Iron and steel manufactures	251,480,677	225,861,387	621,209,453
Oils, mineral	152,174,056	133,693,275	166,423,230
Oils, vegetable	16,251,486	25,831,745	27,167,220
Paper and manufactures thereof	20,663,634	19,848,358	29,111,004
Meat products	143,261,846	205,785,468	266,795,608

Cotton exports, however, continue to decrease, being valued at $374,186,247 in 1916, as compared with $376,217,972 in 1915 and $610,475,301 in 1914.

In addition to merchandise, gold was exported to the value of $90,249,548 and silver to the value of $59,791,523. As compared with past years the imports of gold caused by excess of exports were enormous. (See also XIII, *Economic Conditions;* and XIV, *Banking and Currency.*)

Exports by Groups of Ports.—Official statistics show the following exports from the various groups of customs districts for the fiscal year ending June 30, 1916:

	1915	1916
Atlantic Coast	$1,739,159,496	$3,037,435,279
Gulf Coast	508,434,734	485,106,238
Mexican Border	14,801,494	20,523,040
Pacific Coast	173,685,617	275,959,725
Northern Border	332,019,531	514,634,583
Interior Ports	488,468	.....
Total	$2,768,589,340	$4,333,658,865

Exports from the Atlantic Coast, by reason of the huge increase in our European commerce, almost doubled in value. Other districts showed increases also, with the excepton of the interior ports and the Gulf Coast, which latter district has shown a steady decline since 1914, due principally to the decline in cotton exports during the war.

Exports to American Dependencies.—Shipments to the non-contiguous territories of the United States were valued at $116,130,631 in 1916, as compared with $100,538,956 in 1915 and $106,711,680 in 1914, a gain of 15.5 per cent. in 1916. Every territory, with the exception of the Philippines and Tutuila, showed an increase in goods received from the United States. The greatest relative increase (over 700 per cent.) occurred in Guam, while Alaska and Hawaii showed the largest absolute increases, $5,709,702 and $6,224,602, respectively. The territorial trade in 1916 exceeded in importance the commerce of the United States with any one of the foreign markets of Italy, British India, Argentina, Mexico, or the Netherlands. The shipments to non-contiguous territories of the United States in 1915 and 1916 were as follows (see also VIII, *Territories and Dependencies*):

	1915	1916
Alaska	$20,792,609	$26,502,311
Hawaii	24,600,585[1]	30,825,187
Porto Rico	30,149,764	34,927,311
Philippines	24,691,611	23,365,899
Guam	33,279	282,085
Tutuila	271,108	227,838
Total	$100,538,956[1]	$116,130,631

[1] Official figures revised since issue of the YEAR BOOK for 1915.

Imports from Foreign Countries.—Imports from foreign countries during 1916 resumed their increase in value, which has continued uninterrupted since 1911 save for the year 1915. They totaled $2,197,883,510 in the fiscal year ending June 30, 1916, in comparison with $1,674,169,740 in 1915, an incease of 31 per cent., and reached the highest figure ever recorded. While imports from belligerent countries are naturally relatively small, the trade with other portions of the world seems to have increased in spite of difficulties. The distribution of imports by continents was as follows:

IMPORTS OF MERCHANDISE, BY CONTINENTS

Continent	1913	1914	1915	1916
Europe	$892,866,384	$895,602,868	$614,354,645	$616,252,749
North America	361,943,659	427,399,354	473,079,796	591,895,543
South America	217,734,629	222,677,075	261,489,563	391,562,018
Asia	276,494,777	286,952,486	247,770,103	437,181,464
Oceania	37,543,441	42,144,398	52,522,552	96,225,991
Africa	26,425,344	19,149,476	24,953,081	64,765,745
Total	$1,813,008,234	$1,893,925,657	$1,674,169,740	$2,197,883,510

Every continent shows an increase, but European imports continue to decline in relative importance. In 1912 these comprised 49.5 per cent. of the

total; in 1913, 49.2 per cent.; in 1914, 47.2 per cent.; in 1915, 36.7 per cent., and during the fiscal year 1916 only 28.0 per cent. Asia, Oceania and Africa show the greatest relative increases, while the largest absolute increase ($189,411,361) was experienced by Asia. This is attributable to increases in goods purchased from China, British East Indies and Japan. The increased trade with Africa may be ascribed to British Africa and Egypt.

The following table shows the imports from belligerent and neutral countries in 1914, 1915 and 1916:

	1914	1915	1916
Entente Allies	$1,012,018,960	$826,945,355	$1,169,416,275
Teutonic Allies	231,331,147	114,092,067	16,782,701
Neutrals	650,575,550	733,132,318	1,011,684,534
	$1,893,925,657	$1,674,169,740	$2,197,883,510

Of the total imports from the Teutonic Allies $13,945,743, or 83 per cent., came from Germany. Trade with neutral nations, as will be seen, continued to increase. The value of the imports from the principal countries since 1913 is shown in the following table:

Country	1913	1914	1915	1916
Great Britain	$295,564,940	$293,661,304	$256,351,675	$308,443,223
Germany	188,963,071	189,919,136	91,372,710	13,945,743
France	136,877,990	141,446,252	77,158,740	102,077,620
Brazil	120,155,855	101,329,073	99,178,728	132,663,984
Cuba	126,088,173	131,303,794	185,706,901	228,977,567
Canada	120,571,180	160,689,709	159,571,712	204,018,227
Japan	91,633,240	107,355,897	98,882,638	147,644,228
Italy	54,107,364	56,407,671	54,973,726	57,432,436
Mexico	77,543,842	92,690,566	77,612,691	97,676,544
British India	67,949,259	73,630,880	51,982,703	71,745,626
British Oceania	15,450,442	22,418,262	27,508,028	65,201,971
Argentina	26,863,732	45,123,988	73,776,258	112,512,420
Chile	27,655,420	25,722,128	27,689,780	64,154,859
China	39,755,757	40,311,340	40,829,710	72,405,278
Straits Settlements	35,782,185	26,307,860	24,989,878	82,114,598

All of the countries named, with the exception of course of Germany, show increased exports to the United States, in sharp contrast with 1915, when imports from nearly all the important countries were less than in the previous year. Argentina now takes an important place and Chile, the Straits Settlements and China at least a temporary position among the important sources of American imports. Of the countries of less trade importance during the past year, the imports from which aggregate $10,000,000 or over, the following rank in the order given: British India, Australia, Netherlands, Egypt, Philippines, Spain, Dutch East Indies, Peru, Switzerland, Colombia, British South Africa, Venezuela, Uruguay, Germany, Dominican Republic, Sweden, and New Zealand.

All of the great groups of imports except manufactures ready for consumption showed an increase in 1916, the greatest absolute increase being in crude materials for manufacturing. This group increased in value by $368,748,084, or 64 per cent., and formed 42.9 per cent. of the total imports in 1916, as compared with 34.3 per cent. in 1915. Crude foodstuffs and manufactured foodstuffs decreased in relative importance, forming 11.4 per cent. and 14 per cent. of the total in 1916, respectively, in comparison with 13.3 per cent. and 17 per cent. in 1915. Manufactures ready for consumption decreased both absolutely and relatively and formed only 14.3 per cent. of the total imports. In contrast with 1915, woolen manufactures, cotton manufactures, leather and manufactures thereof were the only important imports showing declines from the previous year, while all other important imports increased in value, including su-

gar, rubber, wool, hides and skins, raw silk, silk manufactures, fibres and manufactures thereof, vegetable oils, paper and paper manufactures, wood, fruits and nuts, iron and steel goods, chemicals, precious stones, and coffee.

While large imports of gold were considered a feature of the year 1915, they were insignificant when compared with the value of gold, coin and bullion, imported in 1916, which amounted to $494,009,301. This is more than two and one-half times the figure for 1915 and is the largest in our history. In addition silver valued at $34,154,375 was imported, as compared with $29,110,323 in 1915. (See also XIII, *Economic Conditions;* and XIV, *Banking and Currency.*)

Imports by Groups of Ports.—An increase in value of imports occurred in all sections of the country in 1916, the largest absolute increase occurring on the Atlantic Coast and the largest relative increase on the Pacific Coast. The following table shows the distribution of the imports of 1915 among the various groups of ports:

	1915	1916
Atlantic Coast	$1,212,655,650	$1,562,179,535
Pacific Coast	158,858,408	262,975,769
Northern Border	164,897,211	214,196,786
Gulf Coast	102,388,415	110,154,169
Interior Ports	14,568,584	14,580,134
Mexican Border	20,801,472	33,797,117
Total	$1,674,169,740	$2,197,883,510

Imports from American Dependencies.—The value of merchandise imported from the non-contiguous territories of the United States during the fiscal year ending June 30, 1916, is shown in the table below:

	1915	1916
Alaska	$27,039,470	$48,965,477
Hawaii	61,831,381	64,389,597
Porto Rico	42,306,350	60,906,453
Philippines	24,020,169	28,232,249
Guam	.....	.....
Tutuila	.....	.....
Total	$155,197,370	$202,493,776

The increase in imports from dependencies apparent in 1915 continued during 1916 and amounted to 30 per cent. The year 1915 had shown an increase of 35 per cent., as compared with a decrease in 1914. Alaska increased greatly in relative importance, furnishing 24 per cent. of the total, in contrast with 17 per cent. in 1915, and Porto Rico furnished 30 per cent. of the 1916 total, as compared with 27 per cent. in 1915. Hawaii, although showing an increase of $2,558,216, decreased in relative importance. The total domestic imports from these dependencies exceeded the total exports to them by $86,363,145. Foreign merchandise valued at $597,714 and gold and silver valued at $19,951,789 were also received from the non-contiguous territories. Ninety-eight per cent. of the total bullion came from Alaska.

The Balance of Trade.—The following official figures, which include receipts and shipments of both merchandise and specie, indicate the changes in the balance of trade for the past 16 years:

Fiscal Year	Merchandise			Merchandise and Specie		
	Imports	Exports[1]	Excess of Exports	Imports	Exports	Excess of Exports
1900	$849,941,184	$1,394,483,082	$544,541,898	$929,770,670	$1,499,462,116	$569,691,446
1901	823,172,165	1,487,764,991	664,592,826	925,609,873	1,605,235,348	679,625,475
1905	1,117,513,071	1,518,561,666	401,048,595	1,198,646,897	1,660,004,502	461,357,605
1906	1,226,562,446	1,743,864,500	517,302,054	1,367,226,716	1,848,307,154	481,080,438
1907	1,434,421,425	1,880,851,078	446,429,653	1,591,878,298	1,988,989,327	397,111,029
1908	1,194,341,792	1,860,773,346	666,431,554	1,387,337,210	1,991,127,472	603,790,262
1909	1,311,920,224	1,663,011,104	351,090,880	1,399,879,023	1,810,225,714	410,346,691
1910	1,556,947,430	1,744,984,720	188,037,290	1,645,504,529	1,918,834,796	273,330,267
1911	1,527,226,105	2,049,320,199	522,094,094	1,646,770,367	2,136,579,810	489,809,443
1912	1,653,264,934	2,204,322,409	551,057,475	1,749,251,653	2,326,541,422	576,289,769
1913	1,813,008,234	2,465,884,149	652,875,915	1,923,470,775	2,615,261,082	691,790,307
1914	1,893,925,657	2,364,579,148	470,653,491	1,990,790,920	2,531,582,700	540,791,780
1915	1,674,169,740	2,768,589,340	1,094,419,600	1,874,848,818	2,965,755,675	1,090,906,857
1916	2,197,883,510	4,333,658,865	2,135,775,355	2,726,047,186	4,483,699,936	1,757,652,750

[1] Including both foreign and domestic.

While no excess of exports over imports of the magnitude of that apparent in 1915 ever before appeared in the history of our foreign trade, the 1915 figures were greatly exceeded by those of 1916. The latter fiscal year showed the enormous export balance of $1,757,652,750, compared with $1,090,906,857 in 1915. This figure would have been even greater but for the excess of $403,759,753 in gold imported over gold exported. (See also XIII, *Economic Conditions.*)

Prices.—It is impossible to conclude this description of the foreign trade without noting the fact that a part of the increase in value of goods exported and imported was caused by a rise in prices. Thus Bradstreet's index number was 8.9985 in 1914, 9.8531 in 1915, and 11.7853 in September, 1916. The London *Economist* index number has risen from 2643 in 1914 to 4372 in September, 1916, and Gibson's index number from 60.8 for 1914 to 78.4 in September, 1916. These index numbers furnish some idea of the proportion of the rise in export and import values which was due to rising prices rather than increased quantities of goods. (See also XIII, *Economic Conditions;* and XVI, *Labor.*)

INLAND WATERWAYS AND COASTWISE COMMERCE

Domestic Trade of the Great Lakes.—The official figures of the traffic passing through the American and Canadian Sault Ste. Marie canals in the calendar year 1914, provided by the Chief of Engineers, U. S. Army, are shown below; figures for 1915 are not yet available:

Commodities	1913	1914
Coal, short tons	18,622,938	14,487,221
Flour, bbl	10,212,667	9,715,085
Wheat, bus	204,821,507	150,284,095
Other grain, bus	112,230,369	68,338,072
Manufactured and pig iron, short tons	402,912	239,683
Salt, bbl	730,431	777,208
Copper, short tons	85,378	91,764
Iron ore, short tons	48,109,353	31,413,765
Lumber, board ft.	599,586,000	452,148,000
Building stone, short tons	6,181	
General merchandise	1,770,860	1,317,304
Total short tons	79,718,344	55,369,934

The total freight tonnage passing through the Sault Ste. Marie canals, for the year 1914, amounted to 55,369,934 short tons, as compared with 79,718,344 tons in 1913. The decrease in tonnage was general with respect to all commodities except salt and copper. Wheat, grain and manufactured iron show the greatest declines. The total traffic of the St. Mary's Falls Canal (American) for the year 1914 was 27,771,467 short tons, as compared with 37,022,201 short tons in 1913.

Statistics of the commerce passing through the Detroit River are available for 13 consecutive years and up until the year 1914 had shown a rapid increase. The figures for the year 1914, however, do not even equal those of 1912. The following table shows the number of passages, net registered tonnage, estimated freight tonnage and value, for the years 1902 to 1914 inclusive:

	Number of Passages	Net Registered Tons	Freight Tons Estimated	Estimated Value
1902	33,000	39,328,689	44,260,506	$440,834,640
1903	33,113	37,453,796	46,817,245	471,917,830
1904	29,472	33,049,984	42,792,326	453,598,656
1905	35,599	45,912,622	55,508,360	522,888,751
1906	35,128	50,673,897	63,808,571	662,971,053
1907	34,149	53,959,769	71,226,895	697,311,302
1908	27,883	40,628,850	54,086,750	614,425,480
1909	32,296	54,668,846	67,789,369	732,803,079
1910	33,638	58,821,282	73,526,602	771,294,055
1911	30,612	52,142,703	66,951,231	745,167,201
1912	33,675	61,606,271	78,671,208	859,089,591
1913	37,473	62,092,149	85,376,705	927,191,016
1914	31,913	52,927,106	69,810,853	800,032,375

Vessels to the number of 1,041 used this passage during 1914, as compared with 1,156 in 1913. Of the total in 1914, 837 were steamers, 189 sailing vessels, and 15 gasoline boats. The average tonnage of all vessels using the River was 2,002 tons.

A company known as the Great Lakes Transit Co. has been formed with a capital of $20,000,000 to acquire and operate the steamships formerly operated by railroad companies on the Great Lakes. This company, it is reported, will control 85 per cent. of the passenger business, packet-freight and grain steamships in this trade. Its fleet will comprise 25 vessels with a freight capacity of 150,000 tons. There has been much complaint since the sale of the lake lines by the railroads, because many of the through lake-and-rail rates formerly in effect have since been withdrawn. The combination of local rates which this made necessary results in substantially higher charges in many instances than lake-rail shippers were accustomed to paying.

New York State Canals.—While the customary decline in the tonnage of products transported on the New York State canals took place in 1915, the total of products carried being 1,858,114 tons, still the value of products transported increased to $30,610,670. The latter result is to be attributed to the recent general rise in commodity prices. Of the total value of products transported, forest products comprised 17.5 per cent., agricultural products 24.9 per cent., manufactures 4.5 per cent., merchandise 40.9 per cent. and miscellaneous 12.2 per cent. Of the freight tonnage moved *via* the Erie Canal, about 18 per cent. was through freight and 82 per cent. way freight, while the way freight on the Champlain Canal constituted 47 per cent. of the total tonnage. The freight carried on the Oswego Canal increased by 86,607 tons due to the fact that this canal was opened to through navigation between the Erie Canal at Syracuse and Lake Ontario at Oswego. The tonnage of the Cayuga and Seneca Canal decreased by 102,314 tons by reason of its being closed between Geneva and the Erie Canal. The following table shows the traffic of the New York canals since 1900:

	Tonnage on New York State Canals					Total Quantity	Total Value
	Erie	Champlain	Oswego	Cayuga and Seneca	All Others		
1900	2,145,876	972,867	31,742	130,126	65,330	3,345,941	$84,123,772
1906	2,385,491	740,983	172,228	164,874	77,331	3,540,907	66,501,417
1907	2,415,548	678,506	143,277	112,570	58,013	3,407,914	63,903,970
1908	2,177,443	614,762	92,831	81,029	85,812	3,051,877	54,511,509
1909	2,031,307	732,125	121,717	84,957	146,430	3,116,536	59,081,572
1910	2,023,185	684,027	110,079	80,125	175,996	3,073,412	59,042,178
1911	2,031,735	770,668	113,891	98,854	81,920	3,097,068	49,577,629
1912	1,795,069	590,723	83,580	80,753	55,991	2,606,116	38,444,617
1913	1,788,453	554,892	61,554	149,874	47,262	2,602,035	36,865,451
1914	1,361,764	492,014	55,705	128,698	42,669	2,080,850	28,277,991
1915	1,155,235	503,030	142,312	26,384	31,153	1,858,114	30,610,670

On May 15, 1915, the Barge Canal from the Hudson River at Waterford to Oswego on Lake Ontario was officially open to navigation for the first time, and, as has been stated, the Oswego Canal was in 1915 opened to through navigation for the first time in five years. Other canal improvements continued during the year, including terminals at Fort Edward, Fort Plain, Crescent, Troy, Mechanicville and Thomson, making a total of 22 canal terminals thus far provided (see also XXI, *Civil Engineering*). The cause of the decline of canal traffic in general was commented upon in the Year Book for 1914 (p. 525).

Coastwise Trade.—The state of the coastwise trade on the North-Atlantic seaboard during 1915 as compared with the preceding year is illustrated by the coastwise movements at a few of the larger ports. The Philadelphia Maritime Exchange reports 4,142 arrivals and 4,165 departures of coastwise vessels at Philadelphia during

1915, while the figures for 1914 were 4,170 and 4,187 respectively.

The coastwise trade passing through the Panama Canal during the fiscal year 1916 amounted to but 227,103 tons of cargo westbound and 217,285 tons eastbound. The coast-to-coast traffic was exceedingly heavy until shortly before the closing of the Canal by slides in the middle of September, but when the canal was reopened in the following April the coastwise traffic did not revive. During June, the closing month of the fiscal year 1916, but two coastwise vessels, carrying 18,805 tons of cargo, made the westbound passage, and no coastwise vessels passed through the Canal from the Pacific to the Atlantic coast. (See also *Merchant Marine, supra.*)

EXPRESS COMPANIES

Official figures of the Interstate Commerce Commission show that nine leading express companies (enumerated in the table below) operated over an average of 301,878 miles in the fiscal year ending June 30, 1915, as compared with 302,696 in 1914, 301,168 in 1913, and 283,303 in 1912. Their aggregate gross receipts from operation were $148,989,084 in 1915, in comparison with $158,879,059 in 1914, $168,880,923 in 1913, and $160,121,032 in 1912, a decline of about six per cent. in 1915 as compared with 1914. Payments for the express privilege fell from $79,858,819 in 1914 to $73,507,563 in 1915, but total operating revenue continued the declining tendency of 1914 and fell from $79,020,240 to $75,481,521 because of the decline in gross receipts. Total operating expenses, however, showed a satisfactory decline of more than 7 per cent, and as a result net operating revenue aggregated $3,951,540, as compared with $404,529 in 1914. Two companies (Adams and Western), however, showed an excess of operating expenses over operating revenues. The following table shows the principal items for the nine companies in the fiscal year ending June 30, 1915:

Company	Gross Receipts from Operation	Cost of Express Privilege	Total Operating Revenue	Operating Expenses	Net Operating Revenue
Adams	$35,139,984	$17,167,041	$17,972,943	$18,088,935	*115,992*[1]
American	49,124,062	23,458,861	25,665,201	24,660,305	1,004,896
Canadian	3,208,222	1,554,427	1,653,795	1,575,942	77,853
Globe	609,660	303,433	306,227	298,631	7,596
Great Northern	3,190,805	1,903,533	1,287,272	1,058,576	228,696
Northern	2,818,843	1,515,586	1,303,257	1,060,618	242,639
Southern	14,385,982	7,278,117	7,107,865	6,302,801	805,064
Wells, Fargo & Co.	39,290,297	19,724,414	19,565,883	17,860,840	1,705,043
Western	1,221,229	602,151	619,078	623,333	*4,255*[1]
Total	$148,989,084	$73,507,563	$75,481,521	$71,529,981	$3,951,540

[1] Deficit.

The operating income (net operating revenue minus express taxes and uncollectible revenues from transportation) of these companies in the fiscal year 1915 amounted to $2,556,210. Preliminary statistics recently issued by the Interstate Commerce Commission show that during the fiscal year 1916 this figure increased to $10,560,648. The operating income of each of the nine companies, with the exception of the Globe, which went out of business on April 30, 1915, underwent considerable increase. As in the case of the American railroad system as a whole, the express business during the year 1916 was in a prosperous condition for the first time in a number of years. The operating income of each of the principal express companies during the fiscal year 1915-16 is shown in the following table:

Company	1915	1916
Adams	*$816,998*[1]	$1,927,561
American	583,812	3,280,737
Canadian	31,677	264,064[1]
Globe	*3,600*[1]	*9,462*
Great Northern	183,417	255,159
Northern	181,792	299,688
Southern	631,444	1,562,238
Wells, Fargo & Co.	1,280,872	2,879,867
Western	*16,206*[1]	100,796
Total	$2,556,210	$10,560,648

[1] Deficit.

THE POST OFFICE

Cost of Postal Service.—The total revenues, expenditures and excess receipts and payments of the Post Office, as reported by the Post Office Department, are shown for the years since 1900 in the table below:

	Postal Revenues	Postal Expenditures	Deficit
1900	$102,354,579	$107,740,267	$5,385,688
1905	152,826,585	167,399,169	14,572,584
1906	167,932,782	178,449,778	10,516,996
1907	183,585,005	190,238,288	6,653,283
1908	191,478,663	208,351,886	16,873,223
1909	203,562,383	221,004,103	17,441,720
1910	224,128,657	229,977,224	5,848,567
1911	237,879,823	237,648,926	230,897[1]
1912	246,744,015	248,525,450	1,781,435
1913	266,619,525	262,067,541	4,551,984[1]
1914	287,934,565	283,543,769	4,390,796[1]
1915	287,248,165	298,546,026	11,297,861

[1] Excess revenue.

The figures, as will be noted, show a deficit in 1915 for the first time in three years of $11,297,861, a result ascribed to the fact that postal receipts stayed about stationary, while the average rate of increase since 1910 had been over 7 per cent. Postal receipts fell off immediately after the beginning of the European War and the loss continued in varying degree throughout the fiscal year ending June 30, 1915. The distribution of expense among the various services is shown below:

	1900	1913	1914	1915
Service in Post Office	$51,214,498	$123,454,470	$134,633,166	$139,936,546
Railway mail service	8,839,767	22,925,614	26,265,352	28,408,243
Rural delivery service	420,499	45,702,413	47,443,711	49,805,851
Railway mail pay	37,315,724	51,959,387	56,155,496	59,576,288
Other means of transportation	7,794,212	13,375,142	15,037,105	17,337,637
Transportation foreign mail	2,155,567	4,258,621	3,768,101	3,273,436

Nature of the Various Services.—The length, annual travel, and rate of expenditure for the various classes of mail services other than star routes are shown for the fiscal year ending June 30, 1915, in the table on the following page.

As the total rate of expenditure in 1914 was $93,945,311.17, the year 1915 as a whole shows an increase of $5,326,224.15, or 5 per cent. The deficit in operation shown in the table above is not to be ascribed to this, however, but rather to the decline instead of the usual increase in postal revenues. Inland service cost $96,196,660.29 in 1915, as compared with $90,379,987.28 in 1914, thus showing an increase in 1915 of about 6 per cent. The most important factor in the increased expenditures was the larger amount paid for railroad transportation, resulting from a readjustment of the rates following the quadrennial reweighing in one contract section. Other factors were increased salaries to rural mail carriers, post-office clerks, and city-delivery carriers as a result of the appropriation act of March 9, 1914. The decrease in the cost of foreign mail service was due to the reduction of 23 per cent. in number of articles sent and a decrease of 13 per cent. in number of articles received.

Railway Mail Pay.—Payments to railroads in 1915 aggregated $59,576,288, as compared with the following in previous years:

1910	$49,405,311
1911	50,583,123
1912	51,691,301
1913	51,959,388
1914	56,155,496

Two bills were submitted to Congress in 1914 for adoption as the basis of computation of railway mail

POSTAL SERVICES

	Number	Aggregate Length (miles)	Annual Travel (miles)	Annual Rate of Expenditure
Star routes in Alaska	21	4,544.00	249,331.10	$260,518.50
Steamboat routes	260	32,402.15	5,684,860.00	990,313.84
Mail-messenger routes	8,094	5,545.34	12,807,455.45	2,160,961.18
Pneumatic-tube routes	6	56.57	.....	961,707.00
Wagon routes (in cities)	291	1,447.66	6,013,654.27	2,519,157.86
Railroad routes	3,484	233,675.56	499,011,047.78	53,934,570.65
Railway post-office cars	.....	.....	.....	4,214,181.42
Electric and cable car routes	569	8,182.68	13,947,850.96	819,452.41
Total	12,725	285,853.96		$65,860,862.86
Star routes in Alaska (emergency)	.....	.....	.....	$35,958.03 [1]
Steamboat routes (pound rate)	.....	.....	.....	94,614.10 [2]
Railroad transportation, misc.:				
Periodical mails	.....	.....	.....	651,366.60 [2]
Mail weighings, etc	.....	.....	.....	381,492.43 [2]
Screen wagon, miscellaneous:				
Ferriage	.....	.....	.....	60,356.72 [2]
Experimental collection and delivery service, Wash., D.C.	.....	.....	.....	29,141.51 [2]
Freight on mail bags, postal cards, etc	.....	.....	.....	552,196.22 [2]
Railway mail service (officers, clerks, etc.)	.....	.....	.....	28,530,621.17 [3]
Miscellaneous expenses	.....	.....	.....	50.65 [3]
Total inland service				$96,196,660.29
Foreign mails:				
Aggregate cost	.....	$3,114,999.98	.....	.....
Less postal receipts at Shanghai, China and Vera Cruz, Mex. [4]	.....	40,124.95 [4]	.....	3,074,875.03
Total	.....	.....	.....	$99,271,535.32

[1] Authorization. [2] Actual expenditures. [3] Estimated actual expenditures.
[4] Cost of intermediary service to foreign countries cannot be ascertained at this time on account of conditions in Europe.

pay (*A. Y. B.*, 1914, p. 529; 1915, p. 537). The distinguishing feature of both was the proposed adoption of space instead of weight as a principal basis for determining compensation. The Post Office Appropriation Act of 1916 determined for the time being this long-existing controversy. Its provisions were briefly the following:

(1) The continuance of the present basis of weight as the principal factor in compensation.

(2) The Postmaster-General may, however, adopt space as a basis of compensation on such routes and systems as may be necessary in order to furnish the Interstate Commerce Commission with the data hereafter referred to. The bill stipulates the maximum rates which may be paid in such cases.

(3) The Interstate Commerce Commission is empowered to investigate the subject of railway mail pay and to fix and determine from time to time fair and reasonable rates and methods for ascertaining the rate of compensation.

(4) The Postmaster-General is required to furnish the Interstate Commerce Commission with data necessary for the ascertainment of proper rates and methods of pay.

(5) If the final decision of the Interstate Commerce Commission be adverse to the space system, the Postmaster-General shall readjust the compensation paid the routes or systems mentioned in paragraph (2) above in accordance with the Commission's decision.

While it might have been concluded, and was by the railroads, that the provisions of the Appropriation Act referring to railway mail pay were intended to afford the Postmaster-General an opportunity to experiment in a small way with the space principle of payment, complaints now arise that this principle is to be applied on mail routes from which the railroads derive 90 per cent. or more of their mail compensation. The railroad representatives filed with the Interstate Commerce Commission a memorandum asking (1) a preliminary hearing before the space test is applied; (2) the designation of a set period for the operation of the test; (3) con-

current weighing of the mails during the continuance of the test; (4) the keeping of contemporaneous and continuous statistics during the weighing and space tests; (5) prescription of other conditions and requirements necessary for a proper test; and (6) withdrawal of the consent of the Commission if it cannot make a proper order prior to Nov. 1, 1916, on which date the Postmaster-General was to begin the space-rate system. The application of the railroads, however, was denied by the Interstate Commerce Commission.

The Parcel Post.—The previous increase in the growth of the parcel-post system continued during 1915, according to the latest count, made in October, 1915, which showed an increase of 10 per cent. in the number of parcels handled as compared with the result of a count made in April, 1914. It is estimated that this service is now handling 1,000,000,000 parcels annually, as compared with 800,000,000 previously handled annually. The reduction in 1913 of the cost of insuring parcels increased this branch of the business from an annual average of 5,000,000 to 13,000,000 insured parcels in 1914; and in 1915 this figure grew to 18,000,000, an increase over 1914 of above 35 per cent. An order effective Sept. 1, 1915, extended this principle still further by providing for a fee of three cents where the indemnity did not amount to more than $45 and a fee of 25 cents where the indemnity did not exceed $100. Further demonstration of the utility of the c. o. d. privilege was given by the growth in number of such parcels handled from 3,000,000 in 1914 to 4,000,000 in 1915. An additional parcel-post feature was inaugurated on Sept. 1, 1915, whereby the sender of a parcel may obtain a receipt for the parcel at the time of mailing by the payment of a fee of one cent. This is not insurance but merely furnishes evidence in case of loss that the parcel was received by the Post Office for transmission.

TELEGRAPHS AND TELEPHONES

Telegraphs.—The YEAR BOOK for 1914 (p. 532) contained a comparison of the telegraph industry in 1907 and 1912 as reported by the United States Census Bureau. Complete data for later years are not available, but the principal business operations of the Western Union Telegraph Co., which largely controls the telegraph business in the United States, are shown in the following table for the fiscal years ending Dec. 31, 1914, and Dec. 31, 1915:

	1914	1915
Stock (outstanding)	$99,786,758	$99,786,727
Funded debt	28,745,000	31,994,000
Miles of wire	1,581,571	1,583,593
Offices	25,784	25,142
Total income	47,287,388	52,475,721
Expenses	40,578,751	40,972,541
Net revenue	6,708,637	11,503,180
Interest, etc	1,337,242	1,335,588
Net profits	5,371,395	10,167,592
Cash dividends	3,988,886	4,986,364
Appropriated for Reserve	1,000,000	.....
Surplus for year	382,509	5,181,228

The corresponding operations of the principal competitor of the Western Union Telegraph Co., the Mackay Companies, a voluntary association of many allied telegraph companies, which controls the Commercial Telegraph Cable Co. and through it the system known as the Postal Telegraph, were as follows during the fiscal years ending Feb. 1, 1915, and Feb. 1, 1916:

	1915	1916
Common stock	$41,380,400	$41,380,400
Preferred	50,000,000	50,000,000
Income from investments in other companies	4,246,014	4,274,941
Operating expenses	60,584	55,741
Balance	4,185,430	4,219,200
Dividends	4,069,020	4,069,020
Surplus for year	116,410	150,180

Telephones.—The YEAR BOOK for 1914 (p. 529) showed a comparison of the telephone industry in 1907 and 1912 as reported by the United States Census Bureau. As in case of the telegraph industry, complete data for later years are not available, but the operating returns of the American Telephone and Telegraph Co. in 1914 and 1915 were as shown in the following table:

	1914	1915
Capital stock	$344,681,900	$380,477,100
Funded debt	159,505,000	120,182,700
Stations[1]	8,648,993	9,151,221
Miles of wire	17,475,594	18,505,545
Total earnings[1]	46,196,599	46,809,354
Net earnings[1]	40,557,977	41,117,487
Net income[1]	32,334,814	34,618,638
Dividends[1]	27,572,675	29,100,591
Surplus for year[1]	4,762,139	5,518,047

[1] Figures for American Telegraph & Telephone Co. proper.

The combined operations of the entire Bell System, including subsidiaries (except the Western Union Telegraph Co.), and excluding all duplications, are shown in the following table for the years ending Dec. 31, 1914, and Dec. 31, 1915:

	1914	1915
Gross earnings	$225,952,123	$239,909,649
Operating expenses and taxes	93,613,216	97,667,918
Maintenance and depreciation	73,091,628	76,059,974
Net earnings	59,247,279	66,181,757
Interest	18,940,641	18,095,643
Net income	40,306,638	48,086,114
Dividends	30,304,186	32,897,065
Surplus for year	10,002,452	15,189,049

STREET AND ELECTRIC RAILWAYS

The unofficial estimates of the *Electric Railway Journal* indicate that approximately 1,044 miles were added to the country's electric-railway mileage during the calendar year 1915, as compared with an addition of 946 in 1914. Of the total added in 1915, 596 miles represent new electric-railway track built, and 448 miles electrified steam mileage.

The total electric-railway mileage of the United States in June, 1915, according to the unofficial returns of the *Journal* (issue of Jan. 22, 1916), was approximately 46,454 miles, as compared with 45,004 in 1914; and the electric-railway companies operated 99,405 cars and locomotives, as compared with 97,721 in the preceding year. The number of companies, miles of track and equipment were geographically distributed as follows:

Districts	Number of Companies	Miles of Track	Cars	Electric Locomotives
New England states	93	6,115	14,260	116
Eastern states	320	13,600	37,571	154
Central states	318	15,961	28,260	93
Southern states	102	2,431	4,673	7
Western states	194	8,347	14,129	142
Total	1,027	46,454	98,893	512

Complete data of electric-railway earnings are not currently available. The returns of 16 companies having a gross revenue of approximately $281,000,000 in 1915, however, indicates a slight decline in both gross and net earnings for the calendar year 1915 as compared with the previous year. Their returns for the month of January, 1916, on the contrary, show an increase of approximately 8 per cent. in gross and 14 per cent. in net earnings over January, 1915 (*Electric Railway Journal*, April, 1916). The latest detailed and complete statistics covering all the street and electric railways of the United States are the census returns of 1912, which were summarized in the YEAR BOOK for 1914 (pp. 532-34).

RAILROADS

Physical Condition and Services.—The single-track mileage of all the railroads making returns to the Interstate Commerce Commission on June 30, 1915, was 257,569 miles. On the lines included in these returns there were 66,502 locomotives, 1,742 more than on June 30, 1914; and 2,525,094 cars, 21,272 more than in the preceding year. Of the total cars in service, 2,370,532 were in the freight service, 55,810 in the passenger service, and 98,752 in company service. The average number of employees, not including those in the employ of roads whose gross operating revenues were

reported as less than $100,000 or those in the service of switching and terminal companies, was 1,409,342, a decrease of 286,141 since the same date in the year 1914.

During the fiscal year 1915 the railways making reports to the Interstate Commerce Commission carried 976,303,602 passengers, a decrease of 76,835,116 over the corresponding returns for 1914; and the total freight carried, including freight received from connections, was 1,802,018,177 tons, a decrease of 174,119,978 tons as compared with the traffic carried in the preceding year. The aggregate ton mileage was 276,830,302,723, or less than the ton mileage of 1914 by 11,489,587,487 ton miles.

Since the close of the fiscal year 1915 there has been a heavy increase in the freight traffic of the railroads. The figures showing the total volume of their traffic are not as yet available. It was sufficient, however, together with various increases in freight charges, to bring about a substantial increase in the net revenues.

Operating Revenues.—The operating revenues of the railroads for the fiscal year 1915 were $2,956,193,202, as compared with $3,047,019,908 in 1914. The official returns of the Commission for the fiscal year 1916 are not as yet available. Unofficial returns published by the Bureau of Railway Economics, Washington, D. C., indicate that the operating revenues of lines having annual revenues above $1,000,000 increased from $2,870,913,815 in 1915 to $3,396,808,234 in the fiscal year 1916. These unofficial returns show the sources of railway revenues in 1916 to be approximately as follows: freight services, $2,409,393,699; passenger services, $673,472,119; mail services, $60,057,967; express services, $81,014,684; and other operating revenues, $172,869,765.

Operating Expenses.—The operating expenses of the railroads in the fiscal year 1915 were $2,088,682,956, as compared with $2,200,313,159 for the preceding year. Unofficial figures covering the lines having annual revenues above $1,000,000 show an increase to $2,220,004,233 for the fiscal year 1916, in comparison with $2,020,823,953 in 1915. The unofficial returns for operating expenses for the year 1916 were distributed as follows: maintenance of way and structures, $405,389,892; maintenance of equipment, $558,777,771; traffic, $60,604,496; transportation, $1,096,632,406; general, $79,392,991; and all other expenses, $19,206,677.

Net Income.—The net operating revenues as officially reported by the Interstate Commerce Commission decreased from $955,166,874 in 1913 to $846,706,749 in 1914 and to $867,510,246 in 1915. It is since the latter year that a marked change has occurred. Unofficial returns for roads having annual operating revenues above $1,000,000 show an increase from $850,089,862 in 1915 to $1,176,804,001 in 1916. The increase was caused by the unusual growth in traffic and by certain increases in railroad charges.

Unofficial returns also show that the operating income of the railroads, consisting of their net revenues from railway operations minus tax accruals and uncollectible railway revenues, increased from $716,220,856 in 1915 to $1,029,241,804 in 1916. The operating ratio of these lines declined from 70.3 per cent. in 1915 to 65.4 per cent. in 1916.

The "net income," the net returns remaining after all income has been included and all expenses deducted, was officially reported to be $308,378,567 in 1915, as compared with $287,019,876 in 1914. Complete data for the fiscal year 1916 are not as yet available. The Interstate Commerce Commission estimated late in December that the total net income from the operations of American railroads, excluding lines having annual operating revenues of less than $1,000,000, were approximately $1,098,000,000 during the calendar year 1916. This estimate was based upon the returns of the first nine months ($785,558,266), and is regarded as conservative.

Capitalization.—The increase in railroad capitalization noted in previous years continued during the fiscal year 1915, the total outstanding railroad securities increasing from $20,247,301,257 par value in 1914 to $21,127,959,078 in 1915. The assignments of capitalization as reported by the Interstate Commerce Commission for the past three years were as follows:

RAILROAD CAPITALIZATION

Classes of Securities	1913	1914	1915
Common stock	$7,231,515,045	$7,304,479,846	$7,599,937,801
Preferred stock	1,379,096,282	1,376,279,858	1,389,001,758
Mortgage bonds	8,186,366,426	8,496,370,538	9,047,182,748
Collateral trust bonds	1,189,636,796	1,182,683,530	1,229,922,755
Plain bonds, debentures and notes	1,107,076,783	1,142,016,070	1,210,565,212
Miscellaneous funded obligations	82,858,275	72,700,640	
Income bonds	250,290,655	254,230,505	247,359,856
Equipment trust obligations	369,285,450	418,540,270	403,988,948
Total	$19,796,125,712	$20,247,301,257	$21,127,959,078

The reported capitalization of the railroads in 1914 and 1915 may be compared with the reported investment in road and equipment, which aggregated $16,983,946,107 in 1914 and $17,247,101,881 in 1915.

Dividends.—The railroads reporting to the Commission declared dividends in the fiscal year 1915 aggregating $328,404,532, as compared with dividends of $451,653,346 in 1914, $369,077,546 in 1913, and $400,315,313 in 1912.

Railroad Consolidation.—The tables showing the mileage and grouping of the largest railroad consolidations and independent systems included in issues of the YEAR BOOK for 1910 to 1913 (p. 564), were omitted in 1914 and 1915 because the numerous changes that were then under way made the control of many lines indefinite. Some of this indefiniteness still continues, but it is now possible to construct a revised table of railroad groups and systems as shown on the following page.

It is apparent that large consolidations still prevail, but that far-reaching changes have occurred since the last mileage table was published in the YEAR BOOK for 1913. The Vanderbilt, Pennsylvania, Morgan, Hill and Harriman groups remain largely intact, although various changes in the relationship between the lines comprising them, as noted in the 1914 and 1915 issues of the YEAR BOOK, have occurred. It was, moreover, announced during the year that the New York, Chicago & St. Louis, of the Vanderbilt group, was sold to an independent syndicate of capitalists. In August, 1916, it was announced that the Pennsylvania Railroad Co. was planning the consolidation of the Pan-Handle, Vandalia and other of its southwestern lines into a holding company with an authorized capital stock of $250,000,000. The holding company is to be known as the Pittsburg, Cincinnati, Chicago & St. Louis Railroad Co.

The principal changes in the groups of railroads have, however, occurred in those that were formerly definitely controlled by "Erb-Yoakum," "Gould," "Moore," and "New Haven" interests. As is shown in the table, many of the lines comprising the first three of these groups or consolidations are now in the hands of receivers, and the definite control of some of their lines has been lost. The New Haven group has been widely affected by the dissolution case referred to in previous issues of the YEAR BOOK, and during 1916 (Aug. 29) the Boston and Maine, which has the largest mileage of any line of the New Haven group, went into the hands of a receiver.

Freight Rates.—While no general change in freight rates as far-reaching as those resulting from the five per cent. advance rate case of Dec. 18, 1914, occurred during the year, many important revisions were made. Partly as a result of the recommendations of the Interstate Commerce Commission in its five per cent. advance rate decision of July 29, 1914, the carriers in Central Freight Association territory have rechecked the distances which are applied in connection with their Central Freight Association class-rate scale. They have also revised the scale itself and have filed tariffs embodying the changes to become effective Dec. 1, 1916. On Nov. 22 the Interstate Commerce Commission suspended these tariffs temporarily from Dec. 1, 1916, to March 31, 1917.

The eastern railroads also proposed advances in their rates on export iron

RAILROAD GROUPS AND SYSTEMS

I. Vanderbilt Interests:	Mileage
Boston & Albany	304
New York Central, Lake Shore & Michigan Southern	5,208
Michigan Central	1,800
New York, Chicago & St. Louis[1]	567
Lake Erie & Western	906
Big Four	2,361
Pittsburgh & Lake Erie	224
Chicago, Indiana & Southern	359
Toledo & Ohio Central	446
Other affiliated eastern lines	677
Western Maryland	661
Chicago & Northwestern[2]	10,162
Total	23,675

II. Pennsylvania Railroad Interests:	
Pennsylvania System	11,821
Norfolk & Western	2,013
Total	13,834

III. Morgan Interests:	
Erie Railroad	2,543
Pere Marquette[4]	2,321
Southern Railway System	8,648
Cincinnati, New Orleans & Texas Pacific	337
Mobile & Ohio	1,122
Atlantic Coast Line System	6,060
Louisville & Nashville	6,880
Chicago Great Western	1,496
Total	29,407

IV. Formerly Controlled by Gould interests:	
Wabash System[3]	2,515
Wheeling & Lake Erie[4]	512
Missouri Pacific[4], St. Louis Iron Mountain & Southern[4]	7,294
St. Louis Southwestern[4]	1,818
Texas & Pacific	1,991
International & Great Northern[4]	1,160
Denver & Rio Grande, Western Pacific[4]	4,071
Total	19,361

V. Formerly Controlled by Moore Interests:	
Rock Island System[4]	8,330
Delaware, Lackawanna & Western[2]	1,000
Lehigh Valley[2]	1,444
Total	10,774

[1] Sold to independent syndicate in 1916.
[2] Jointly with other interests.
[3] Receivership, Dec. 26, 1911; sold July 21, 1915.

VI. Harriman Interests:	Mileage
Oregon Short Line	2,120
Oregon-Washington R.R. & Nav. Co.	2,067
Union Pacific System (remainder)	3,615
Southern Pacific System	10,397
Illinois Central System	6,423
Central of Georgia	1,924
Baltimore & Ohio System[2]	4,600
Delaware & Hudson System[2]	930
San Pedro, Los Angeles & Salt Lake[2]	1,415
Cincinnati, Hamilton & Dayton[2, 4]	1,015
Chicago & Alton[2]	1,050
Total	35,556

VII. Hill Interests:	
Northern Pacific	7,749
Great Northern	7,870
Chicago, Burlington & Quincy System, Colorado & Southern	12,434
Total	28,053

VIII. Formerly Controlled by Erb-Yoakum Interests:	
Minneapolis & St. Louis	1,646
Toledo, St. Louis & Western[4]	451
Frisco System[4]	6,391
Chesapeake & Ohio	2,545
Missouri, Kansas & Texas System[4]	3,536
Hocking Valley	352
New Orleans, Mobile & Chicago[4]	403
Total	15,324

IX. New Haven Interests:	
New York, New Haven & Hartford	2,046
Boston & Maine[4, 5]	2,302
New York, Ontario & Western	568
Maine Central	1,209
Central New England	304
Rutland[2]	468
Other lines	208
Total	7,105

X. Atchison, Topeka & Santa Fe System	11,546
XI. Chicago, Milwaukee & St. Paul System	10,442
XII. Seaboard Air Line System	3,262
XIII. Philadelphia & Reading System	2,427
Grand total of above groups and systems	210,766

[4] In hands of receiver.
[5] Stock held by Federal trustees pending reorganization.

and steel traffic. Hearings, however, were held before the Interstate Commerce Commission in September, and on Sept. 29 the tariffs that had been filed were suspended to Jan. 29, 1917. The rates on iron ore from lake ports to interior iron and steel centers were revised by order of the Commission, some rates being reduced and others advanced as a result of the maximum-distance rate scale that was promulgated.

Many commodity rates were changed, although there was no sweeping change in the general level of all freight rates. The eastern lines, for example, were authorized in December, 1915, to advance many of their live-stock rates, although in June, 1916, numerous lines throughout the United States were ordered to reduce some of their rates on less-than-carload shipments of live stock. In New England many interstate

rates on milk and cream were reduced, the Commission prescribing lower maximum rates. Various rates on paper were advanced, although other increases that had been proposed were suspended. (See also *Rulings of the Interstate Commerce Commission, infra.*)

In the West two additional parts of the Western rate-advance case (*A. Y. B.*, 1915, p. 541) were decided during 1916. In Part II (37 I. C. C. Repts. 114, Dec. 18, 1915) the Commission authorized the increase of the rates on carload lots of agricultural implements except to points in Louisiana; on canned goods and on flue lining in Western Trunk Line territory. The Commission, however, refused to permit the proposed increase of the rates on eggs, cider and vinegar, bauxite, boots and shoes, leather and boot and shoe findings, dried and evaporated fruits, furniture, and various other commodities. In Part III (38 I. C. C. Repts. 94, Feb. 8, 1916) the Commission permitted the western carriers to increase their minimum carload weights on grain products, wheat and rye; and to advance their rates on bituminous coal, gas coke, wheat and corn, when shipped between various points. But it suspended the proposed advance of their rates on broom and corn shipped from Kansas and Oklahoma to Colorado and New Mexico.

Further rate changes in western territory during the year were those on transcontinental traffic. In the preceding issue of the YEAR BOOK (p. 542) it was noted that the transcontinental railroads were granted special relief from the application of the long-and-short-haul clause of the Interstate Commerce Act with respect to a large group of westbound commodity rates. Later when the Panama Canal was closed by slides and the principal coast-to-coast steamship lines were attracted to the foreign trade with Europe by extraordinarily high ocean rates, the intermountain cities complained that the relationship between the rates on Group-C commodities to the Pacific terminals and to intermountain points should be changed, because the extent of water competition was for the time being greatly reduced. The Commission, therefore, on June 5, 1916, rescinded its former order regarding Schedule-C commodities; also its former order authorizing special rates on iron and steel from Pittsburg and related points; and its previous orders respecting rates on California products shipped *via* the Gulf routes to the Atlantic seaboard. The transcontinental railroads thereupon filed tariffs in which they proposed to increase their rates on Schedule-C commodities to Pacific terminals. Before the new tariffs became effective, however, complaint was made before the Commission, which, on Aug. 31, 1916, suspended them until Dec. 30. The railroads then initiated a move to come to an understanding with the complaining shippers so as to narrow and define clearly the issues which the Commission will need to adjust. Later, on Oct. 21, the Interstate Commerce Commission reopened the entire transcontinental long-and-short-haul question, and it announced that hearings would be held during the months of November and December. The reopening of the entire case was made on the application of the Merchants' Association of Spokane, which is making an effort to readjust the relationship between transcontinental points and intermediate points in accordance with the long-and-short-haul principle.

Freight rates in trans-Missouri territory were changed as a result of a decision by the Interstate Commerce Commission in which a scale of maximum class rates was prescribed and the former relationship between the class rates to and from various points in Kansas, Nebraska, Missouri and Iowa was changed (40 I. C. C. Repts. 201, July 3, 1916). The Commission ordered the reduction of numerous carload commodity rates from St. Louis to points in northeast Texas, and ruled that the rates from Kansas City should be at least 5 cents per 100 lb. less than those from St. Louis (40 I. C. C. Repts. 619, June 27, 1916). On July 7 it readjusted the rates between Shreveport, La., and points in Texas in its now famous "Shreveport case" (41 I. C. C. Repts. 83, July 7, 1916). In the same decision it ordered the carriers to refrain from applying to transportation

within Texas any classification rules different from, and minimum carload weights lower than, those applicable to shipments between Shreveport, La., and Texas points.

The railroads in southern territory have been gradually adjusting many of their rates in accordance with the principles announced by the Interstate Commerce Commission in its long-and-short-haul decisions of 1914. In its decision of Dec. 31, 1915, they were ordered to readjust their rates on bituminous coal shipped from Tennessee, Virginia and West Virginia fields to southeastern destinations (37 I. C. C. Repts. 652, Dec. 31, 1915). (See also *Rulings of the Interstate Commerce Commission, infra.*)

Freight and Passenger Receipts.—The average receipts per ton per mile as reported by the Interstate Commerce Commission were 0.732 cents in the fiscal year 1915, as compared with 0.733 cents in the preceding year; and the average receipts per passenger per mile were 1.985 cents and 1.982 cents respectively in 1915 and 1914. The average receipts per ton per mile and per passenger per mile for the railway system as a whole during the years 1900 to 1915 were as follows:

Year	Receipts per Ton per Mile, cents	Receipts per Passenger per Mile, cents
1900	.729	2.003
1905	.766	1.962
1906	.748	2.003
1907	.759	2.014
1908	.754	1.937
1909	.763	1.928
1910	.753	1.938
1911	.757	1.974
1912	.744	1.985
1913	.729	2.008
1914	.733	1.982
1915	.732	1.985

RULINGS OF THE INTERSTATE COMMERCE COMMISSION

The following are the principal decisions rendered by the Interstate Commerce Commission since the 1915 issue of the Year Book:

(1) Western Advance Rate Case, Parts II and III; Bituminous Coal Rates to the Southeast; and Transcontinental Rate Case. (See "Freight Rates," *supra.*)

(2) Interstate *v.* Intrastate Rate Cases: The Shreveport Case (41 I. C. C. Repts. 83, July 7, 1916); the Missouri River-Nebraska Cases (40 *ibid.*, 201, July 3, 1916); Traffic Bureau of the Sioux City Commercial Club *v.* American Express Co. *et al.* (39 *ibid.* 703, May 23, 1916); Bonners Ferry Lumber Co. *v.* Great Northern Ry. Co. (38 *ibid.*, 268, Feb. 21, 1916); Dallas Chamber of Commerce *v.* Atchison, Topeka & Santa Fe Ry. Co. (40 *ibid.*, 619, June 27, 1916; 41 *ibid.*, 552, Nov. 7, 1916); Business Men's League of St. Louis *v.* Atchison, Topeka & Santa Fe Ry. Co. (41 *ibid.*, 13, July 12, 1916).—The most important decisions of the Commission during 1916 are those which will doubtless become the basis for ultimately establishing the relative scope of Federal and state control over rates. These decisions of the Commission in turn refer back to the Minnesota rate decision (*A. Y. B.*, 1911, p. 562) and the Shreveport decision of the U. S. Supreme Court (*A. Y. B.*, 1914, p. 341).

Rates are frequently interdependent, and this is true regardless of whether they are interstate or intrastate. Since in the past the latter were subject to the exclusive control of the states, it thus frequently happened that by establishing rates on intrastate traffic the states were virtually establishing interstate rates. Sometimes, however, the carriers refused to apply the relatively low state-made intrastate rates to their interstate traffic, with the result that interstate commerce was subjected to an unreasonable discrimination or disadvantage. Whether or not the Interstate Commerce Commission shall have superior jurisdiction in such instances is the real bone of contention in these decisions.

In the Shreveport case of July 7, 1916, which is supplemental to the earlier decisions of the Commission (23 I. C. C. Repts. 31; 34 *ibid.*, 472), the Federal Commission decided that:

(1) The class rates between Shreveport, La., and points in Texas are unreasonable and unduly prejudicial to Shreveport as compared with the class rates for like distances in Texas, and that in the future they should not exceed the reasonable maximum class rates prescribed by the Commission.

(2) The rates on numerous commodities between Shreveport and points in Texas are likewise unreasonable and prejudicial, and that they should not in the future exceed the reasonable maximum commodity rates between Shreveport and Texas points prescribed by the Commission.

(3) The application to shipments within Texas of classification rules different from, or minimum carload weights lower than those applicable to shipments of like property between Shreveport and Texas is unduly prejudicial to Shreveport, and that the undue prejudices should be removed.

The carriers then proceeded to apply the order of the Interstate Commerce Commission to traffic within Texas. They obtained an injunction in a Federal court restraining the Texas Commission from imposing the penalties provided in the commission laws of Texas and from in any way preventing the application within Texas of the rates and classification rules prescribed by the Interstate Commerce Commission. While the case was before the Interstate Commerce Commission, the Texas Commission had agreed to advance the rates on certain commodities 10 per cent. Being dissatisfied, however, with the order of the Federal Commission, the Texas Commission, on Aug. 28, issued an order cancelling these advanced rates. Thereupon the Interstate Commerce Commission issued an order directing the Texas railroads to show cause why they should not put into effect the commodity rates cancelled by the Texas Commission.

In October, 1916, a lengthy informal conference of the various parties concerned in the Shreveport dispute was conducted before the Interstate Commerce Commission. The conference was called in answer to various requests that the newly filed tariffs of the railroads should be suspended. At the present writing final action has not been taken. The attorney-general of Texas has also filed a suit in the state court against 34 railroads that were not parties to the injunction proceedings mentioned above, asking for an injunction to restrain them from putting into effect the new tariffs that were filed with the Interstate Commerce Commission.

In the Missouri River-Nebraska cases the Interstate Commerce Commission (1) prescribed a schedule of maximum class rates between points in the State of Nebraska and Council Bluffs and Sioux City, Iowa; St. Joseph and Kansas City, Mo.; and Atchison, Kan.; (2) it ruled that the present relation of class rates between Council Bluffs, Sioux City, St. Joseph, Kansas City and Atchison and points in the state of Nebraska and between Omaha and other Nebraska cities and the same points in the state of Nebraska results in undue preference to Omaha and other Nebraska cities, and subjects the interstate shipments to undue and unreasonable prejudices and disadvantages; (3) it further ruled that similar undue and unreasonable prejudices and discrimination result from the present relation of classification ratings and exceptions, the Nebraska state classification applying within that state, and the Western classification applying to interstate shipments; and (4) it ordered the carriers to "cease and desist from the undue preferences and the undue and unreasonable prejudices and disadvantages found to exist." When the railroads took action to remove the undue discrimination against interstate shipments by increasing their intrastate rates within the state of Nebraska, the Nebraska Commission obtained an injunction from the Supreme Court of the state restraining the railroads from putting into effect the new tariffs which they had prepared subsequent to the order of the Interstate Commerce Commission.

In the South Dakota express-rate case the Interstate Commerce Commission prescribed certain express rates and ordered the companies to remove the undue discrimination resulting from lower rates charged within South Dakota. The attorney-general and the Railroad Commission of South Dakota thereupon obtained an injunction forbidding the express companies to charge rates on shipments within the state of South Dakota other than those prescribed by the state Commission. The American and Wells, Fargo Express Companies also obtained injunctions from Federal courts forbidding the state authorities to interfere with them in putting into effect the rates pre-

scribed by the Interstate Commerce Commission.

In the Bonners Ferry Lumber Co. case it was shown that the rates on lumber in carloads from Bonners Ferry, Idaho, to various points in Montana were unjustly discriminatory as compared with rates from Libby and Eureka, Mont., to the same destinations in Montana. The Commission therefore declared the rates on the interstate shipments to be unreasonable, and they prescribed reasonable and non-discriminatory rates for the future, leaving with the carriers the determination of the question of how the discrimination as between interstate and intrastate shipments is to be removed.

The Dallas Chamber of Commerce decision was less directly concerned with the main question at issue, but the evidence submitted in it was made part of the record in the Shreveport case. The Commission found certain carload commodity rates from St. Louis and points in northeast Texas to be unreasonable to the extent of five cents per 100 lb., and ruled that the rates from Kansas City to the same points are unreasonable to the extent that they are not as much as five cents per 100 lb. less than the rates contemporaneously maintained from St. Louis. One of the effects of this decision is futher to reduce the size of Texas common-point territory. The railroads had formerly constituted Dallas-Fort Worth as a separate rate group. The Commission believed that

> the present record shows that a like exception should be made in rates from St. Louis and Kansas City to northeast Texas. . . . As to traffic from St. Louis and Kansas City to points in northeast Texas, those points are at a disadvantage as compared with Shreveport, a competing locality, by reason of the shorter distance to Shreveport, and the competitive conditions at that point, but that natural disadvantage ought not to be unduly increased by an artificial rate adjustment.

The dispute as to the relative authority of the Interstate Commerce Commission and the various state commissions has not been confined to freight rates and classifications and express rates; it has been extended also to the making of passenger fares. As the result of its rulings in the Business Men's League of St. Louis *v.* Atchison, Topeka & Santa Fe Railway Co. *et al.*, decided July 12, 1916, the Interstate Commerce Commission, as far as this case applies, has practically eliminated the Illinois two-cent fare law. It decided that the passenger fares between St. Louis, Keokuk and Illinois points are unreasonable in so far as they exceed 2.4 cents per mile plus a reasonable bridge toll. The Commission, however, simultaneously ruled that these interstate fares are unjustly discriminatory against St. Louis and Keokuk and in favor of East St. Louis, Chicago and other Illinois points, because the fares charged within the state are limited by the two-cent fare law. The Commission therefore required the carriers to remove the discrimination between interstate and intrastate fares where found to be unjust.

These decisions of the Interstate Commerce Commission have brought the entire contention as to relative state and Federal jurisdiction to a head. It is likely that the question will ultimately need to be settled before the Supreme Court of the United States.

(3) National Society of Record Associations *et al. v.* Aberdeen & Rockfish R. R. Co. *et al.* (40 I. C. C. Repts. 347, June 29, 1916); Eastern Live Stock Case (36 *ibid.*, 675, Dec. 2, 1915).—In the Eastern Live Stock case the Commission authorized an increase in many rates on live stock, fresh meats, and carload minima within the Central Freight Association territory, and on shipments from Central Freight Association territory to points in Trunk Line and New England territories. In the other case mentioned it found numerous classifications, rates and shipping rules applicable to the shipment of less than carload lots of live stock to be unreasonable and discriminatory. It prescribed reasonable minimum live-stock weights, standard or basic values and excess-value rate increases, and reasonable rates on small stock in crates. It also declared unlawful the requirements of the carriers that shippers' attendants shall accompany shipments.

(4) New England Milk Case (40 I. C. C. Repts. 699, July 11, 1916).—The Commission found the so-called New England or leased-car system of milk transportation to be unlawful. Instead it prescribed a scale of rates on a per-can basis for less than carload shipments made in passenger, mixed milk and passenger, and freight-train services; also rates lower by 25 per cent. for milk shipped in freight cars on freight trains; and carload rates, not more than 87½ per cent. of the less than carload scale rates, for carload shipments made from one consignor to one consignee and from one point of origin to one destination, the cars to be iced by the shipper of the milk.

(5) Iron Ore Rate Cases (41 I. C. C. Repts. (181, July 10, 1916).—The Commission decided that the existing rate groups of lake ports and iron-ore destinations, and the existing rate relationships of the destination groups are unreasonable. Instead it prescribed a revised grouping of ports and destinations; revised rate relationships, and a scale of maximum iron-ore rates. The result of these changes points to increased rates in some instances and decreased rates in others. The Commission also required the carriers to establish separate charges for storing ore on their docks, for various other dock services performed by them, and for switching and other services on private industrial tracks; it prescribed maximum rates for dock services, and suggested a charge on the engine-hour basis for the switching and other services performed by the railroads on private industrial tracks.

(6) Car Spotting Charges (34 I. C. C. Repts. 609, July 6, 1915).—The Commission decided that the tariffs proposing a "spotting charge" for placing cars for loading or unloading at points on the tracks of the industrial concerns named in the tariffs that were filed are not justified, because the proposed spotting charge was in many cases applied to services covered by the line-haul rate, and because the collection of the special spotting charge in some instances and not in others would result in unjust discrimination. The Commission held that:

> The line-haul rate covers the customary movement of cars over industry tracks incident to the receipt and delivery of carload freight at convenient points on those tracks for loading or unloading without regard to the size or complexity of the industry, and the points at which the cars are to be placed by the carrier for that purpose without additional charge are to be determined by general usage. . . . [But] the line-haul rate covers only one placement of a car upon an industry track for loading or unloading, and an additional charge should be made for each additional placement of a car for that purpose, as also for the movement of cars from place to place within the plant during the processes of manufacture.

(7) Second Industrial Railway Case (37 I. C. C. Repts. 497, Dec. 23, 1915; 37 *ibid.* 491, 567, Jan. 3, 1916; 41 *ibid.*, 46, 69, July 6, 1916).—The famous industrial railway case mentioned in previous issues of the YEAR BOOK (1915, p. 544) was continued during the year. In a number of decisions the Commission specifically applied the principles that it had laid down in the original decisions. It decided whether or not, in particular instances, the industrial railways are common carriers, and whether or not they are entitled to divisions or switching allowances, and if so, the maximum amount to which they are entitled.

(8) Special Reports to the Senate.—On Oct. 11, 1915, the Commission made its report (36 I. C. C. Repts. 429) on the conditions affecting the production, transportation and marketing of crude petroleum which had been requested in the Senate resolution of Sept. 28, 1914. This report contains detailed data regarding (1) the control of pipe-line companies, and (2) the discontinuance of the running and purchase of petroleum in 1914 and the reasons therefor. On April 11, 1916, the Commission made its report to the Senate concerning the relation between carriers by rail and carriers by water. The report was made in answer to a resolution dated May 16, 1914. It contains detailed data as to the ownership and control of vessel properties by rail carriers. It indicates that on June 30, 1914, the railroads of the United States controlled, directly or indirectly, a total of 1,098 vessels having a total gross tonnage of 2,941,941 tons.

LEADING COURT DECISIONS

The following are the principal court decisions affecting railroads since the last issue of the YEAR BOOK:

(1) St. Louis, Iron Mountain & Southern Ry. Co. *v.* Arkansas (240 U. S. 518, April 3, 1916).—In this decision the U. S. Supreme Court upheld the right of a state to compel railway companies to conduct switching operations across public crossings in cities of the first and second classes with a switching crew of not less than one engineer, a fireman, a foreman and three helpers. It decided further that a full-crew statute of this kind is not unconstitutional even though it contains an exemption in favor of railways less than 100 miles in length.

(2) Seaboard Air Line *v.* Railroad Commission of Georgia (240 U. S. 324, Feb. 21, 1916).—The U. S. Supreme Court ruled that it is within the power of a state, acting through a commission, to require crossing or intersecting railways entering the same point to make and maintain track connections for the interchange of traffic if the established facts show a public necessity, and if due regard is given to the advantages which will result on the one side and to the necessary expenses that will be incurred on the other.

(3) J. D. O'Keefe, receiver of the New Orleans, Texas & Mexico R. R. Co. *v.* United States and Interstate Commerce Commission (240 U. S. 294, Feb. 21, 1916).—The U. S. Supreme Court upheld the power of the Interstate Commerce Commission to prescribe the maximum allowance out of the joint rates which trunk lines may make to tap lines which are owned by persons who own the timber and lumber mills which they principally serve, even though no joint rate was fixed either by the Commission or by the carriers and they had not been afforded an opportunity to agree in respect to the division. Special note is made of the additional power in this regard that was conferred upon the Commission by the Mann-Elkins Act of June 8, 1910. It further decided that a trunk line has no constitutional right to build up its business by paying tap lines bonuses or rebates which have been forbidden by Congress for considerations affecting the welfare of the public.

(4) Lehigh Valley R. R. Co. *v.* United States (234 Fed. 682, May 12, 1916).—This decision by the Federal district court, commonly known as the "Lake lines divorce decision," was the result of the section in the Panama Canal Act requiring the railroads to dispose of their steamship properties unless the Interstate Commerce Commission, under certain conditions, permitted them to continue such ownership. In May, 1915, the Commission had, in accordance with Section 5 of this Act, refused to authorize a large number of railroads to continue the ownership of their Great Lakes lines. All of the railroads, except the Lehigh Valley, thereupon disposed of their Lake lines. The Lehigh Valley, however, contended that the Commission had acted beyond its legal authority and took the matter to the Federal courts. Its purpose was to compel the Interstate Commerce Commission to permit the Lehigh Valley Railroad to continue its ownership of Great Lakes steamship properties. The Federal Court, however, upheld the action that had been taken by the Commission. It held that the Commission having found the existence of competition, no question might be raised by the court as to whether the Commission's judgment in that regard was correct or incorrect. It also held that the order of the Commission was a negative order in that it had not ordered something to be done, but had merely refused to take certain action. It ruled that

the findings are made final, and final they must remain, but with one qualification—certain fundamental rules must have been obeyed. In spite of the statutory declaration of finality the courts still retain a limited power of supervision—enough to see that constitutional requirements have been observed.

FEDERAL LEGISLATION

Amendment to the Cummins Amendment.—The Cummins Amendment of March 4, 1915, *A. Y. B.*, 1915, p. 546, was amended on Aug. 9, 1916. The provisions imposing full liability notwithstanding any limitation of lia-

bility, agreement or release, now do not apply:

(1) to baggage carried on passenger trains or boats, or trains or boats carrying passengers; (2) to property, *except ordinary live stock*, received for transportation concerning which the carrier shall have been or shall hereafter be expressly authorized or required by order of the Interstate Commerce Commission to establish and maintain rates dependent upon the value declared in writing by the shipper or agreed upon in writing as the released value of the property, in which case such declaration or agreement shall have no other effect than to limit liability and recovery to an amount not exceeding the value so declared or released, and shall not, so far as relates to values, be held to be a violation of Section 10 of this Act to regulate commerce, as amended.

Although the amendment to the Cummins Amendment has been in effect since Aug. 9, 1916, the carriers have not taken any action thus far to change their bills of lading or rate tariffs. Since the Interstate Commerce Commission is now investigating the uniform bill of lading and the uniform live-stock contract, it is likely that no action will be taken until this investigation has been completed.

Bills of Lading Act.—On August 29, 1916, President Wilson approved a Federal Bills of Lading statute, effective on January 1, 1917. The Act consolidates into statutory form a large number of the legal requirements and customs that have for some time governed bills of lading. The principal changes introduced by the act are those with reference to the responsibility of carriers for the issuance of bills of lading by their agents, and their duties with respect to the loading and unloading of freight. The act provides:

[Sec. 20.] That when goods are loaded by a carrier such carrier shall count the packages of goods, if package freight, and ascertain the kind and quantity if bulk freight, and such carrier shall not, in such cases, insert in the bill of lading or in any notice, receipt, contract, rule, regulation, or tariff, "Shipper's weight, load, and count," or other words of like purport, indicating that the goods were loaded by the shipper and the description of them made by him or in case of bulk freight and freight not concealed by packages the description made by him. If so inserted, contrary to the provisions of this section, said words shall be treated as null and void and as if not inserted therein.

[Sec. 22.] That if a bill of lading has been issued by a carrier or on his behalf by an agent or employee, the scope of whose actual or apparent authority includes the receiving of goods and issuing bills of lading therefor for transportation in commerce among the several states and with foreign nations, the carrier shall be liable to (*a*) the owner of goods covered by a straight bill subject to existing right of stoppage *in transitu* or (*b*) the holder of an order bill, who has given value in good faith, relying upon the description therein of the goods, for damages caused by the nonreceipt by the carrier of all or part of the goods or their failure to correspond with the description thereof in the bill at the time of its issue.

As has been the custom when the shipper loads package or bulk freight, Section 21 permits the carrier to insert in the bill of lading the words "shipper's weight, load and count" or other words of like purport, and relieves the carrier from liability for damages "caused by the improper loading or by the non-receipt or by the misdescription of the goods described in the bill of lading."

The former practice, however, is changed by the important proviso that

where the shipper of bulk freight installs and maintains adequate facilities for weighing such freight, and the same are available to the carrier, then the carrier, upon written request of such shipper and when given a reasonable opportunity so to do, shall ascertain the kind and quantity of bulk freight within a reasonable time after such request, and the carriers shall not in such cases insert in the bill of lading the words "shipper's weight" or other words of like purport, and if so inserted, contrary to the provisions of this section, said words shall be treated as null and void and as if not inserted therein.

The act applies alike to railroads and to carriers by water; and to the foreign trade as well as to interstate commerce.

The Eight-Hour Day Act.—On Sept. 3 and 5 President Wilson approved the so-called Eight-Hour Day Act, thereby avoiding a threatened strike of many of the railway engineers, firemen, conductors, and trainmen. In the controversy that preceded this Act the railroad companies offered to arbitrate the demands of the Brotherhoods. The Brotherhoods, on the contrary, refused to arbitrate the eight-hour demand, insisting that unless that portion of their demands was granted a strike would be called. Strike orders had in fact been issued before the President's recommenda-

tions in favor of this statute were accepted by Congress. (See also I, *The Sixty-Fourth Congress;* and XVI, *Labor,* and *Labor Legislation.*)

The Act has not, however, finally settled the controversy. It does not limit the working day of the railroad employees engaged in the movement of trains in interstate commerce to eight hours. Instead it provides that their wages shall be based upon a day of eight hours, with *pro rata* overtime pay for whatever time in excess of eight hours they may work. It establishes an eight-hour pay basis, and is a wage statute rather than an eight-hour day law.

The President has, in accordance with Section 2 of the Act, appointed a commission of three (Gen. George W. Goethals, Edgar E. Clark, and George Rublee) to "observe the operation and effects of the institution of the eight-hour standard workday as above defined and the facts and conditions affecting the relations between such common carriers and employees during a period of not less than six months nor more than nine months." Meanwhile the wages of the railway employees included in the Act are "not to be reduced below the present standard day's wage," with *pro rata* pay for overtime.

The Act becomes effective on Jan. 1, 1917. Many companies have, however, announced that they will not accept the provisions of the Act without making a legal protest. The Missouri, Oklahoma and Gulf brought an injunction proceeding before the U. S. District Court at Kansas City, and as a result Judge Wm. C. Hook, on Nov. 22, held the Act to be unconstitutional. The decision was intended primarily to expedite an appeal to the U. S. Supreme Court. Some companies, moreover, are considering the advisability of readjusting the schedules of their train-operating employees so that those who at present have a workday shorter than eight hours will be required to conform to an eight-hour schedule. The Act also became an issue in the Presidential campaign (see I, *The Presidential Campaign*).

Committee to Investigate Railway Conditions.—By joint resolution of the Senate and House of Representatives, approved July 20, 1916, a joint committee of ten was created to investigate and report upon the entire general question involving the relationship between the Government and the railroads and other public utilities engaged in interstate or foreign commerce. The committee is specifically instructed to investigate the questions of government ownership; the incorporation of carriers; proposed changes in the organization of the Interstate Commerce Commission and Interstate Commerce Act; and "the efficiency of the existing system in protecting the rights of shippers and carriers and in promoting the public interest." One of the chief problems confronting the committee is the controversy respecting the relative jurisdiction of the Interstate Commerce Commission and the state commissions over intrastate rates.

The report of this committee is to be submitted on the second Monday in January, 1917. The committee is composed of five senators and five congressmen selected by the Interstate Commerce Committee of the Senate and the Committee on Interstate and Foreign Commerce of the House of Representatives.

STATE LEGISLATION

Railroad and Public-Utility Commissions.—The table on the following page indicates the types of commissions now existing in the various states, Delaware and Utah being the only states without commissions.

The year 1916 was one of few state legislative sessions, and little commission legislation of importance was enacted. The commission laws of a few states, however, were amended in detail during 1916, and the 1915 session laws of a number of states which were not included in the last issue of the YEAR BOOK are now available (see also XI, *Public Services*).

The commission laws of Maryland were so changed in 1916 as to include within the term "common carrier" all bridges collecting tolls within the state (Md., 1916, Ch. 272). The Tennessee commission law was amended and restated so as definitely to give to the Commission the power to fix maximum rates upon complaint or upon its own motion, to establish

RAILROAD REGULATION BY COMMISSIONS

Railroad Commissions	Public Utility Commissions	Corporation Commissions
Arkansas	Alabama	Arizona
Florida	California	New Mexico
Iowa	Colorado	N. Carolina
Kentucky	Connecticut	Oklahoma
Louisiana	Dist. of Col.	Virginia
Michigan	Georgia	
Minnesota	Hawaii	
Mississippi	Idaho	
Nebraska	Illinois	
N. Dakota	Indiana	
S. Carolina	Kansas	
S. Dakota	Maine	
Tennessee	Maryland	
Texas	Massachusetts	
	Missouri	
	Montana	
	Nevada	
	New Hampshire	
	New Jersey	
	New York	
	Ohio	
	Oregon	
	Pennsylvania	
	Rhode Island	
	Vermont	
	Washington	
	W. Virginia	
	Wisconsin	
	Wyoming	

rate divisions, to suspend newly filed tariffs and to establish through routes, joint rates and classifications; it also prescribes the manner in which appeals may be made from the Commission (Tenn., 1915, Ch. 92). The Colorado legislature defined the term "common carrier" in great detail (Col., 1915, Ch. 134). The Connecticut Commission was given the power to supervise all rates of telephone companies (Conn., 1915, Ch. 178); to approve or disapprove railway mergers (*ibid.*, Ch. 178); and to establish regulations regarding dangerous grade crossings (*ibid.*, Ch. 223); it was, moreover, given exclusive jurisdiction over the manufacture, transmission, and sale of electricity (*ibid.*, Ch. 228). A statute was also enacted to prevent the running of passenger trains with locomotives at the rear unless the consent of the state Commission is obtained (*ibid.*, Ch. 273). The Minnesota Commission was given the power to fix charges for the switching of live-stock cars and for feeding live stock (Minn., 1915, Ch. 367). The Wisconsin Commission was instructed to examine freight and express bills upon request, provided, however, that it need not examine more than 15 bills per month for one shipper or consignee (Wis., 1915, Ch. 428). A Louisiana statute of 1915 declared sugar refineries to be public utilities; it creates a state sugar inspector and subjects the sugar-refinery business to public control (La., 1915, p. 17). The state Commission of Florida was given the power to compel the making of physical connection between the railroads and the docks, terminals, and other structures located on the waterfront (Fla., 1915, Ch. 6977).

Passenger Fare Acts.—No special freight-rate acts of importance were enacted during the year and relatively few passenger-fare laws, as compared with the previous year. In New Jersey a statute made it lawful for railroads to issue free passes to chiefs and captains of police of cities, and to county detectives (N. J., 1916, Ch. 36). The Mississippi legislature made it lawful for railroads to give free passes to Confederate veterans (Miss., 1916, p. 349). Mileage book rates were prescribed in New Hampshire (N. H., 1915, Ch. 18). The Illinois legislature permitted railroads to exchange transportation for advertising space at the regular advertising rates (Ill., 1915, p. 559).

Safety and Public Health Statutes.—The use of intoxicating liquors by railroad engineers was prohibited in Virginia (Va., 1916, p. 640). The placing of warning strings at bridges was required in Mississippi (Miss., 1916, p. 338). Grade crossings were subjected to additional regulation in Connecticut (Conn., 1915, Ch. 223); in New Hampshire (N. H., 1915, Ch. 4); and in Wisconsin (Wis., 1915, Ch. 338). The last named state also enacted several laws regarding the construction of fences (Wis., 1915, Chs. 435 and 551).

Miscellaneous State Regulation.—The New Jersey legislature of 1916 permitted the making of leases, mergers, etc., subject, however, to certain conditions; and it prescribed the method of merging or consolidation that may be legally pursued (N. J., 1916, Ch. 240). It also provided that cities may lease, build, operate, equip, or maintain railroads and likewise lease, build, etc., wharves, piers, warehouses and other terminal facilities (N. J., 1916, Ch. 120). The Mary-

land law regarding consolidation was amended (Md., 1916, Ch. 664); and the railroads were, under certain conditions, given the right to acquire the property and franchises of connecting companies (*ibid.*, Ch. 235). The Delaware legislature in 1915 required the railroads to maintain adequate waiting rooms and landing platforms (Ch. 227). The Massachusetts legislature amended the law regarding the issue of railroad shares to stockholders; no shares may be issued below par and no fractional shares may be issued (Mass., 1915, Ch. 298). It likewise amended the statute regarding the issue of preferred stock (*ibid.*, Ch. 299), and of bonds and notes (*ibid.*, Ch. 303). The laws governing the taxation of railroads were amended in Virginia (Va., 1916, p. 499); in Connecticut (Conn., 1915, Ch. 150); and in Mississippi (Miss., 1916, p. 190). In its extraordinary session of 1915 the legislature of Georgia created a special commission which is to have charge of the leasing or disposal of the Western & Atlantic Railroad.

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XXI. ENGINEERING

CIVIL ENGINEERING

FRANK C. WIGHT

Fall of the Quebec Bridge Center Span.—Probably no other single disaster could have so shocked the engineering profession as the fall on Sept. 11 of the central span of the Quebec Bridge across the St. Lawrence River about seven miles upstream from the city of Quebec. The bridge is the largest in the world; the erection of its central span (the second longest simple truss in the world) was an operation of unprecedented magnitude, and the bridge was notorious for the collapse under construction of the former structure at the same site on Aug. 30, 1907. Engineers the world over were naturally desirous that the second operation be brought to successful completion.

The earlier collapse was the complete failure of an almost completed arm of a huge cantilever extending out from the south side of the river. It was due, without a doubt, to faulty design and inefficient inspection, encouraged or fathered by a petty economy on the part of the responsible authorities in the Canadian Government, which was building the former bridge and which is building the new one. The new bridge, in complete contrast to the old, was being built under the most advanced engineering practice. The Canadian Government was most liberal in its delegation of authority to those technically responsible, the engineers and contractors were of the highest reputation, and their work represents the latest development of the structural art. The failure was due primarily to a flaw in material, a weakness which could not be foreseen, but there is reason also for criticism of the design of one detail, the failure of which undoubtedly started the collapse.

The new Quebec bridge is a cantilever structure spanning 1,800 ft. between piers on either side of the river. The two anchor arms, that is, the arms centering over the two piers and extending out over the river, were completed early in 1916. The work remaining to be done during the summer season of 1916 was the erection of the central span connecting the two extending arms. This span, a through-truss bridge 640 ft. long and 88 ft. wide, with a total weight of about 5,000 tons, was erected completely in place over the shallow waters of a cove at Sillery, about three miles below the bridge site. During erection it was supported on staging, and after the truss work was completed scows were floated in under each end and the span wedged up on them. It was then intended that this huge piece of framework should be towed upstream to the bridge and should be raised the 150 ft. from the water to its connection with the cantilever arm.

This operation was a decidedly delicate one, one which has been carried out on a smaller scale in a number of bridge erections, but never with so large a span nor with so great an elevation. The care with which the design for the work was made was most particular. Probably no other piece of structural work was ever so completely and thoroughly provided for. Great chains were lowered from the four extending trusses, and from each group of chains were suspended two girders, the lower of which was fixed in place and the upper movable in a vertical plane. The two were separated by enormous jacks. From the upper girder there depended a separate set of chains which passed through the lower girder and which had at their lower ends provision for

engaging the cross girders on which rested the end of the truss to be raised. The scows were to be floated in line with the dependent chains, which were to be connected to the girders supporting the span and the scows allowed to float out, leaving the trusses hanging from the cantilever arms. Then, by a slow process of jacking designed to take about 20 hours, the truss was to be raised to its position on the bridge. This raising operation was to be carried out by the jacks between the two upper girders, the movable one of which was to be lowered from time to time to correspond with the various stages in the erecting process.

On the morning of Sept. 11, the wind and weather conditions being propitious, the scows carrying the truss were started up the river about daybreak. The bridge site was reached without difficulty. The delicate performance of attaching the bridge truss to the suspending chains also was accomplished successfully, and some four hours after the span started from its erection site the receding tide allowed the scows to swing free and the huge span was hanging free from the suspending chains. This was supposed to end the most dangerous part of the erection. The jacking process was then started, and the bridge, by slow stages, was raised about 20 ft. above the water without apparent difficulty, when without warning there was a loud report, and immediately the span buckled, collapsed and disappeared into the waters of the St. Lawrence, which there are some 80 to 200 ft. deep.

Investigation showed that the initial collapse took place in the southwest of the four supporting shoes, each one of which carried the truss on the lowest suspended cross girder. These shoes were cruciform steel castings, designed with two-way pins to permit universal motion of the truss under the minor deflections which it was expected to have during the erecting process. This shoe was not in any way permanently connected with the bridge structure, but was merely a support on which the trusses were to rest until lifted into place on the bridge proper. Its failure therefore in no way reflects on the strength of the bridge itself. Marks on the girders and observation of the manner of failure point to the collapse of this one shoe, although the three others seem to have held and all four were in place for some months at Sillery holding a load greater than that held at the time of collapse.

The design of these shoes is the subject of some controversy in engineering circles. It seems probable that the engineers of the Quebec bridge made certain assumptions regarding the stresses in the indeterminate shoe structure which were not entirely justified. The fact that three of the shoes remained intact and that they all held more than the breaking load shows that something more than poor design was responsible. The fallen span is irretrievably lost but a new one was immediately put under fabrication and at about the same time in 1917 it is expected to erect the suspended span in practically the same manner.

Bridges.—No very large new bridges were started in 1916. The most important is the new Key Bridge across the Potomac River at Washington, a reinforced-concrete structure containing four spans approximately 200 ft. each, which will replace the old iron-truss Aqueduct Bridge, which has crossed the river at Georgetown in Washington for many years. The new bridge is a Federal project, and is to be named after Francis Scott Key, the author of the "Star Spangled Banner," whose former home is still kept intact near the approach to the new bridge.

Construction of numerous large steel bridges now under way in the United States continues. These are the Metropolis bridge across the Ohio, the longest simple-span truss in the world; the Sciotoville bridge, also across the Ohio, the longest continuous-span truss; and the Columbia Interstate, a very long steel bridge across the Columbia River at Portland, Ore. The reinforced-concrete viaducts at Cleveland, Minneapolis and Baltimore, the latter on line of Hanover St. across Patapsco Bay, are also well toward completion.

The Memphis bridge across the Mississippi was completed and put

in service during the year, as were also approaches to the Municipal Bridge at St. Louis, which has stood for about three years unused because the approaches could not be agreed upon. There was also completed at Needles, on the Colorado River, between California and Arizona, the third longest steel-arch bridge span in the United States. Its 592-ft. arch is surpassed only by the 840 ft. Clifton arch at Niagara Falls, and the 979½-ft. Hell Gate arch, now practically completed in New York City. The new Needles bridge is a highway bridge, the second one across the Colorado, in the 1,000 miles from its mouth in the Gulf of California.

At two cities discussions are now current as to the desirability of having either a bridge or a tunnel across a large body of water. In San Francisco a board of army engineers had a hearing in regard to the possibility of bridges across the San Francisco Bay, and a number of different projects were entertained, ranging in cost from $17,000,000 for a tunnel to $25,000,000 to $75,000,000 for bridges. Nothing definite has been done in the matter, however. In New Orleans, on the contrary, a state law was passed authorizing a bond issue for a crossing of the Mississippi River and a commission is soon to decide whether a tunnel or bridge is the proper means.

A *resumé* of bridge engineering would not be complete without noting the immense impetus to good bridge building which is being given by the good-roads movement. A good road implies good bridges and the increase in road construction necessarily develops road engineers who are competent to build and design good bridges and who realize their importance. The state and highway engineers who have come recently to take up road building have developed the highway bridge to a new standard of perfection. The very fact that road loadings are uniform, regardless of location, makes it possible for them to standardize their designs and to reach an office control of design not possible in most large bridge work. They can have in their offices designs for practically any length of span and can select without much difficulty a design to fit any particular case. Contractors expert in small-bridge building are also more easily found, so that the combination of more expert engineers with trained constructors is gradually bettering the ordinary highway bridge, which up to now has been usually of a low order of merit.

Railways.—Railway work in the United States during the year has not varied from recent procedure; that is, it consisted of grade and line revision of old roads, addition of extra tracks, the removal of grade crossings, and, in a few instances, in the construction of new lines, extensions or connections. The efforts and ingenuity of the railroad engineers are devoted to the grade-removal work, for almost invariably this has to be conducted under traffic, which complicates construction, and the resulting structures, being in a city, have to possess more artistic quality than is common in railway structures. A secondary, though important, railway work now going on everywhere is the construction of new terminals, which continues to increase. Large new terminals are projected or under way in Chicago (Illinois Central, projected, and Pennsylvania and allied lines, under construction), Indianapolis, and Buffalo (Lehigh Valley and Lackawanna).

An important step forward in railway engineering was the electrification of the Mountain Division of the Chicago, Milwaukee & St. Paul Railway, a distance of 220 miles. This is now the longest stretch of trunk line under electric traction in the world and the only one where electric locomotives are operating over more than one engine division. The construction of the new government Alaska railways goes forward regularly. By the end of 1916 about 85 miles of new construction was completed and several of the connecting links tied up to existing lines (see also VIII, *Alaska*).

Tunnels.—A great number of subaqueous tunnels are now under construction in the United States. These comprise the eight (four groups of two each) under the East River for New York's new subways, water tun-

nels extending out into the lakes at Chicago, Milwaukee and Cleveland, and the Boston subway tunnel under Fort Point Channel near the South Terminal Station. All of these are being built under compressed air except the one at Chicago, which is far enough below the surface and in solid enough rock to be worked in free air. Both this tunnel and the one at Cleveland are being built by day labor under the direction of the city engineers.

An unfortunate accident in the Cleveland tunnel on July 24 resulted in the death of 10 men, one of whom was one of the city engineers directing the work. Inflammable gas in pockets and veins of the clay soil through which the tunnel was being driven exploded from some unexplained source of ignition and completely wrecked the section of the tunnel near the heading. Apparently proper precautions as to ventilation or possible sparking from electric motors or wires were not taken.

Although not in the United States, a *resumé* of tunnel work would not be complete without a brief description of the Rove tunnel now under way near the south end of the Marseilles-Rhone Canal in France. This is the largest tunnel section in the world, moving a total width of 72.2 ft. and height to the elliptical roof of 46 ft. It is 4½ miles long, through the promontory of rock below Marseilles. The tunnel is only one-third completed and the opening of the Canal is still far off.

Subways and Rapid Transit.—During 1916 Cincinnati was added to the list of American cities which have or are to have other than surface rapid transit. The cities now so provided are New York, Philadelphia and Boston with subways and elevated railroads, and Chicago with its elevated. Cincinnati on April 25 voted $6,000,000 for the purpose of constructing a railway through the business district of the city and out of the city to the north in the bed of a canal which will be abandoned. The new line will form a belt around the city, with a surface cross-town connection at some time to be transformed to a rapid-transit line. Interurban terminals also are to be built in connection with the project. In Chicago a rapid-transit commission recommended the extension of the present elevated lines and construction of new elevated, surface and subway lines, all materially increasing the transit accommodation of the city.

In Boston, Philadelphia and New York the new elevated and subway lines under construction are progressing rapidly and are being put in service in links as they are completed. Boston's system is the more nearly finished of the three, with New York next and Philadelphia last. In fact, Philadelphia's full project was not authorized until the election of May 16, 1916, when $57,100,000 was authorized for new lines.

Harbors.—On account of the great boom in American shipping resulting from the European War, there has been an awakened interest in the development of harbors, not only to take care of the present abnormal trade but also to accommodate the hoped-for increase of the future. The interest, however, has not materialized in actual plans in any port but Philadelphia, where $19,000,000 of the $115,000,000 bond issue voted in 1916 is to be devoted to port improvement. This money is partly to improve present facilities but is mainly to carry toward completion the comprehensive port plan first formulated some years ago. This includes the removal of all the present grade crossings at the southern part of the city and the construction of a new elevated railroad entrance to new freight terminals to be built in connection with a new group of municipal docks of the most modern design. Philadelphia is to have in this scheme what no other American major port except New Orleans can boast, an adequate railway connection with ocean docks. Work is already started on one of the new piers and the railway improvements are well along.

In New York the new 1,000-ft. piers at Forty-seventh St. and the North River are progressing favorably, all of the difficult work behind the huge cellular coffer-dams being completed. Another year should see the piers ready for occupancy. Aside from this the progress of the port has been merely routine. The much her-

alded commission of engineers which was to report about January, 1917, on a comprehensive scheme of port development, has never materialized because the Board of Estimate, though tacitly agreeing to its organization, has never provided funds for its administration. The great West Side railroad grade-crossing removal, which not only is to take all railway tracks off the surface but also will provide railroad communication with the ocean piers, made a step forward but is now being held up by the Board of Estimate pending hearings. Agreement on any scheme seems almost hopeless on account of the many diverse interests to be satisfied. In fact every year shows more clearly the truth of the remark of a foreign engineer that New York is the world's greatest harbor but poorest port.

In Boston, state and city politics have again interfered with progress, and a new executive body with different powers and scope has superseded the port governing authority. In consequence all that has been done has been some steps toward the development of the new East Boston improvement and a recommencement of the neglected dry dock. Other American ports have proceeded normally, the only feature point being possibly the increase of municipal dock enterprises, particularly in the smaller cities. (See also X, *Waterways and Harbors.*)

Canals.—Navigation canals in the United States showed no activity in 1916. The two large projects of recent years, the Pittsburgh and Lake Erie Canal and the eight-foot canal to connect the Illinois River with the Chicago Drainage Canal, are both *in statu quo*, as yet only projects with no prospect of early fruition. The New York State Barge Canal work proceeds in its more or less leisurely way. At the end of the 1915 season the new canal was in use from the Hudson to Jacksonburg, mainly in the Mohawk River deepening, and from Newark to Pittsford. These are on the main line of the canal; both branches, the Oswego and the Champlain, are in complete revised operation. By the beginning of the 1917 season it is expected that the canal will be completed from Jacksonburg to east end of Oneida Lake, a distance of 50 miles. This will open a through line for deep-water barges from the Hudson to Lake Ontario *via* the completed Oswego Canal. The carrying of the full new section to Lake Erie apparently remains for the 1917 season. (See also X, *Waterways and Harbors;* and XX, *Inland Waterways.*)

The Panama Canal, which was closed down Sept. 18, 1915, by a huge slide in Gaillard Cut, was not reopened for full-depth navigation until April 15, 1916. The slide excavation, totaling about 10,000,000 cu. yds., was removed at the amazing rate of over 1,000,000 cu. yds. per month. In September a minor slide at Cucuracha, also in the big cut, closed the canal to ships drawing over 17 ft. for about a week. It is confidently expected, however, that the worst of the slides are over and that although minor slips may occur, the shifting rock has reached a practical equilibrium. (See also X, *Waterways and Harbors.*)

Floods.—Two different periods of widely distributed heavy rainfall in 1916 caused a series of severe floods in different parts of the country. The first of these, starting in late December, 1915, and lasting through January, was distributed over the Pacific Coast and the Mississippi Valley. In California the resulting flood centered around Los Angeles and the country south of it. Heavy destruction was quite marked, the particular failure which attracted notice being that of the Lower Otay Dam, noted elsewhere (see *infra*). Farther east, the Colorado River was in flood at the same time, with considerable overflowing of levees and consequent destruction at Yuma, Ariz. On the Mississippi the high water in the middle of January promised to be a record, but fortunately it was not followed by immediate heavy rainfall on the watersheds contributing to the Mississippi, so that it passed down the river with very little damage.

The second period of rainfall was in the summer, particularly during July and August, when the rains were continuous and heavy in the eastern and southeastern parts of the country, producing there the wettest six

weeks in a half-century. In the Southeast particularly the damage was very great. On July 15 and 16, floods in North and South Carolina, Virginia, Tennessee and West Virginia, in the narrow river valleys, resulted in damage well up in the millions and loss of life numbered by hundreds. In these cases the phenomenal rains were the immediate cause. There are on record rainfalls during this time of over 13 ins. inside of 24 hours. Bridges and buildings in great number were washed away, and in consequence of the weakening during the floods, the Lake Toxaway Dam failed at a later time (Aug. 13) while under normal head. On Aug. 9 another localized rainfall in the coal district of West Virginia caused a great loss of bridges and mining property, as well as of life. On Aug. 18 a West Indian hurricane, similar to those which have before wrecked Galveston and surrounding country, swept the Texas coast and destroyed much property, though not to the extent of previous years.

In flood-protection work, two districts which have been visited by destructive floods within the past three years have already started active construction. These are Erie, Pa., where the flood of 1915 swept down through a narrow, thickly built section of the city, and the Miami Valley, where the terrible flood of 1913 broke a record in flood destruction. The Scioto Valley flood-protection work, centering at Columbus, Ohio, which is also a result of the 1913 floods, has been designed by the engineers and is now before the Conservancy Board for approval.

An attempt was made in Congress during the year to put through a flood-protection bill which would insure Federal appropriation of funds for the protection of the Mississippi and Sacramento Rivers from their recurring destructive floods. This bill, fathered by Representative Humphreys of Mississippi, authorized the Secretary of War to spend not more than $45,000,000 in regulating the Mississippi and not more than $5,600,000 in the Sacramento, provided each state benefited contributed at least one-half as much as the Federal appropriation. The bill passed the House but not the Senate. It was a very radical move which was nearly successful. Hitherto all Federal flood protection has been done in the guise of aiding navigation included in the regular Rivers and Harbors Act. This Act in 1916 carried the usual large appropriation (see X, *Waterways and Harbors*), but the federalization of flood-protection work also was nearly established.

Dams.—In 1916 three dams of some size failed, two under extreme condition of flood, and one apparently of purely structural weakness. The most important failure of the three was that of the famous rock-fill Lower Otay dam on the San Diego, Cal., water-supply, which went out on Jan. 27 after being overtopped for the first time in the 18 years since it was built. This dam was a rock-fill structure 130 ft. high, with a centrally embedded steel-plate diaphragm reaching down to a masonry foundation 20 ft. below the stream bed. Its construction was the subject of much controversy and its design was often criticized, on account of the upstream porous fill which threw all of the water pressure against the steel diaphragm. It had always leaked, but until the January floods its reservoir had never been near full, so that the disturbance to the fill due to overtopping water had never taken place. This disturbance undoubtedly caused the failure. It is an amusing fact that just before the January rains the San Diego water supply had been so low that the city council voted to pay a certain "rain maker" $10,000 if he could perform the entirely unexpected feat of causing enough rain to fill the reservoir behind Lower Otay dam. The city now has on its hands a suit brought by this controller of the elements.

The second large dam to fail was the hollow-reinforced concrete dam of the Plattsburg, N. Y., water supply, which went out on May 15. This structure was 35 ft. high and its failure was due to porous percolation below the shallow cut-off wall crossing the valley. In many ways the failure was similar to that of the Stony River dam in West Virginia in 1914 (*A. Y. B.*, 1914, p. 551). The third dam to fail was that at Lake

Toxaway, N. C. This 62-ft. clay fill went out Aug. 13, following weakening during the heavy rains and floods about six weeks before.

In new dams under way or projected, mention should be made of the 300-ft. Hetch-Hetchy dam for the San Francisco water supply, a cyclopean masonry structure ranking among the largest in the world, the St. Maurice hydro-electric project dam in the wilds of Quebec, the Ripogenus dam on the Penobscot, and the Whitney dam for the aluminium interests near Salisbury, N. C.; all of these are remarkable for volume rather than for height. The Elephant Butte dam, on the Rio Grande project of the U. S. Reclamation Service, in Texas, was formally opened in 1916 (see also X, *Reclamation*). This is one of the largest dams in the world, being 1,200 ft. long, 304.5 ft. deep from bottom of excavation to top of parapet wall and 203.5 ft. above original river level, and 215 ft. wide at base. It is of cyclopean concrete and contains 550,000 cu. yds. of masonry. Its reservoir is surpassed only by that of the Assuan and the Gatun dams, although the St. Maurice dam in Quebec will have a reservoir slightly larger.

Water Supply.—Statistics of the water supplies of American cities up to 1915 have been reported by the Bureau of the Census. These data show that of the 204 cities having more than 30,000 inhabitants in the fiscal year 1914-15, 155, or 76 per cent., owned their water-supply systems. Of these cities seventy-three were operating purification plants in that year, and of this number, 61 had either built or improved and enlarged their plant since 1903. Of the 73 cities, 60 obtained their water supply wholly or in part from rivers and other streams, 12 from lakes, and one from wells. The total investment in the 155 municipally owned plants amounted in 1914-15 to $1,071,000,000, and the *per capita* investment to approximately $38. The increase in the *per capita* investment during the 11 years since the previous census report amounted to 31 per cent. During the 11-year period also there had been a remarkable decrease in the death rate due to typhoid fever, and in the large cities the decrease very markedly follows the increase in the purity of the water supply. In Cleveland, for example, the typhoid death rate fell from 111 per 100,000 in 1903 to 8.1 in 1914; in Philadelphia, from 72.3 to 7.6; in Pittsburgh, from 132.7 to 15; in Cincinnati, from 42.2 to 6.2; in Chicago, from 32.5 to 6.6, etc.

The same report notes the history of water purification, from 1829, when some filter beds were first used in connection with the water supply of London, through 1853, when the first purification plant was put in operation in Washington, to the present time, when many different complicated systems are used. The latest development has been the use of chemical disinfection in addition to the ordinary sand purification. The first chemical-sterilization plant was built at Mobile, Ala., in 1900. From 1905 to 1914, such plants were built in 40 other cities of over 30,000, and at the present time more than half the municipally owned water-supply systems having purification plants are using this method either exclusively or in combination with one or more of the other processes. The trend of things seems to show that disinfection of water supplies, probably by the use of liquid chlorine, will be extended eventually to all surface supplies. In the present state of the art it guarantees bacterial purity at a minimum of expense.

In large new water supplies that for San Francisco is the principal one of importance now under way. This Hetch-Hetchy project is progressing slowly as befits its size and importance, but nevertheless regularly. The year has seen progress on the preparation of the main dam site and the construction of the railway to be used along the line of the supply from reservoir to city. No other municipal supply of first magnitude is under design or construction, although the improvements at Hartford, Conn., within a year or two of completion, may be noted. (See also XI. *Water Supply.*)

Sewerage.—The so-called "activated-sludge" method of sewage disposal continues to be the most important feature of sewerage engineering. This process consists essentially

in the forced aeration of sewage in the presence of a considerable volume of sludge which has itself been aerated and thus enlivened with oxygen and bacteria. The aeration apparently hastens the bacterial action which decomposes the sewage into a highly nitrogenous sludge and a liquid of low bacterial count. Many cities are investigating the process on scales of varying degrees, and in some places, notably at Milwaukee, installations of working plants are under way. As yet many of the problems of the process are unsolved but its future is hopeful, to say the least, though the costs so far seem to be high and the difficulties of drying the sludge formidable. It promises to be an approach to the ideal sewage purification, which might be defined as a method which will separate the sewage into an unobjectionable liquid and a sludge that may be readily disposed of, or better still of sufficient dryness and of such nitrogenous quality as to make it useful and profitable as a fertilizer. The activated-sludge studies serve only to emphasize the oft-repeated maxim that the problem of sewage purification is merely a problem of sludge removal, for it is in the reduction and disposal of the sludge that the difficulties of the new process are greatest. (See also XI, *Sewage Disposal.*)

Engineers in Military Service.—The current predominance of military questions and the mobilization of the National Guard into the Federal service combined in 1916 to emphasize the military phase of civil engineering and to arouse interest in military engineering itself. Beginning in 1915 with the general campaign for "preparedness," civilian engineering bodies throughout the country inaugurated studies in military matters through the medium of lectures by regular army officers. These lectures were most enthusiastically received, and many engineers who before had only the vaguest idea of the necessary functions of the engineer in war began to take a most lively interest in such matters and to qualify themselves, at least as far as theory is concerned, for service with the troops in the field.

Furthermore, there was pronounced activity in recruiting in the few National Guard engineer companies, which was augmented by the promise of active service on the Mexican border following the President's order in June. In preparing camp for the unexpected mobilization the Guard engineers did exceptional service and proved that this branch of the National Guard was very efficient. The necessity of a pure and ample water supply, full sanitary conveniences, and satisfactory roads in these camps was fully met, the work even down to the actual manual labor being done as a rule by the troops themselves.

A further opportunity for patriotic service was offered engineers in the establishment of an Officers' Reserve Corps. This is a branch of the new U. S. Army provided for in the Army Reorganization Act enacted by Congress (see also XII, *The Army*). This corps consists of a large engineer contingent to be made up of civilian engineers of both civil and military competence who can pass the necessary examinations and who are willing to submit themselves to early call to arms in time of national crisis. Such officers not only must be expert engineers but must have somewhat more than elementary military knowledge, and furthermore must serve with the colors a limited period each year. Those entering the corps specify the specialty in engineering with which they are most conversant and an effort will be made to assign them to duties of that nature. It is expected that a large number of experts will thus be put at the disposal of the Government.

The increase in the regular Army brings with it a demand for more engineer officers than the present regular establishment can supply and in consequence during the coming five years, commissions in the Engineer Corps, hitherto for the most part reserved for the honor graduates of West Point, will be available to young, unmarried, engineering-school graduates.

A Public Works Engineering Corps.—The predominance of things military has brought to the front also a long-time controversy over the desirability of establishing a Federal of-

fice of public works with a civilian corps of engineers whose duty it should be to construct the engineering works of the nation. This work is now distributed among many departments, such as the Reclamation Service, the Indian Office, the Office of Public Roads and Rural Engineering, the Engineer Corps of the Army, etc. The latter corps has complete charge of all river and harbor improvements, although such improvements have little to do with military affairs. Now that the increased Army and the need for military preparedness promise to demand all of the efforts of the strictly military engineers it is thought by many in the profession that the time is ripe for the divorcing of the civilian and military branches of government engineering and the establishment of one unified civilian corps to take over the work now done by so many. Such a corps should follow European precedent in ensuring regular promotion and life tenure and if possible should be divorced from politics. It is hardly necessary to impress on any one familiar with American public-works practice that its establishment will be a long, tedious process.

ELECTRICAL ENGINEERING

C. D. Fawcett

General Survey.—In strong contrast to 1915, the year 1916 has been a period of commercialism in the electrical industries in this country. Much original work has been done but few results published. The large demand by the belligerent nations in Europe for munitions of war and for commodities which could not be made in their factories necessitated the manufacture of American goods on a scale never before attempted. There was a corresponding demand for electrical generating and power-consuming devices to meet the demands of such production. Scarcity of raw materials throughout the world, especially iron and copper, has caused high prices and in many cases orders have been refused because of inability to secure these metals (see also XVIII, *Copper*, and *Iron and Steel*).

Scarcity of oil for purposes of illumination in the countries affected by the European War has forced the development of electricity on the Continent. The increased use of electricity is not limited to lighting, however, but has been extended to meet the demand for power. Within the war zone and even in the first- and second-line trenches, electricity is being used for lighting, trucking, operating cableways, driving compressors, and for many other purposes which have been newly developed to fit the needs of campaign activities.

The record capacity of the electric motor was again exceeded by orders from three large steel companies, each specifying a single motor of 15,000 h. p. capacity. These are now being manufactured.

A comparison of the total values of exports of domestic electrical apparatus for the past three years indicates the business depression of 1915, the figures for 1916 showing an increase of 50 per cent. over the 1915 trade. The exports of generators, wire and cable for the years 1914 and 1915 were about equal, but in 1916 the export value of generators is less and that of wire and cable is 33⅓ per cent. greater than those of 1914 and 1915. In general this peculiar condition may be traced to the fact that there has been a decreased residential load in all countries at war and an extension of all transmission lines to factories. The power used in the manufacture of materials of war has taken the place of the residential load; the balance of the load-change being such as to make additional generator capacity unnecessary. A further proof of this is shown by the abnormal shipment of large-capacity wires and cables in excess of the shipment of materials for wiring residences. The export of lamps in 1916 exceeded by 130 per cent. the figure for 1915. This has been due to the demand for incandescent lamps, arc lamps and projectors used in the war zones. No doubt a large percentage of the increased orders for electrical apparatus can be assigned directly to the necessity of converting the foreign electrical manufactories into factories

for the manufacture of munitions. (For statistics of the electrical manufacturing industry in this country see XIX, *Manufactures.*)

The power consumption in this country in the East has increased nearly 80 per cent. over that of 1915. In 1915 the Middle West exceeded the eastern section in electrical development. The various industrial centers of the East, however, have developed an enormous load under the pressure of forced production. In many cases this power had to be supplied and used at times of least demand on the central station. Because of this consumption of power for industrial purposes, the East has far exceeded other sections in electrical development.

Central Stations.—There has been a marked increase in the net earnings of most of the large lighting companies during the year. This is due to a greatly increased load and exists in many cases in spite of the decreased rate for lighting and power service. Over the period from August, 1913, to April, 1916, the net earnings of a representative group of 50 lighting companies increased by 33⅓ per cent. It is interesting to compare the *per capita* generation of large cities in this country and abroad. The central stations of Chicago generate 500 kw-hr. of electrical energy as compared with 150 kw.-hr. *per capita* generated by the stations of London. This proportion is practically true of all cities in this country as compared with cities of equal population in France, Spain, Germany and the British Isles. The other foreign countries, with few exceptions, are far below those mentioned in the use of electricity.

The review of progress in large capacity alternators in the YEAR BOOK for 1915 (p. 561) mentioned the maximum ratings for a single unit at 30,000 and 35,000 kw. capacity. The Detroit Edison Co. has recently placed an order for a 45,000 kv.-a. unit. This marks the maximum capacity now being built in a single unit, but a 60,000 kv.-a. multistage (triple-unit) set is being manufactured for the Interborough Rapid Transit Co. of New York City. The main unit of this set is a high-pressure steam turbine. This unit exhausts into two low-pressure turbo-generator sets and the terminals of all three generators are permanently connected in parallel. A proper division of load is obtained through automatic steam governors and hand manipulation of the field rheostats. This compound unit has a two-hour overload rating of 70,000 kv.-a. Several other compound units of 50,000 kv.-a. are now being assembled. Throughout the United States during the last few months, many orders have been placed for large-capacity synchronous generators to displace less efficient lower-capacity units. This illustrates the recognized desirability of obtaining large generator capacity in a minimum number of units. A number of large capacity water-wheel units have been sold during the year, most of them being from 10,000 to 15,000 kv.-a. vertical type, operating at relatively low speeds. The weight of the revolving parts and water thrust is cared for by Kingsbury thrust bearings mounted on top of the generator. The particular feature of this development is the increasing tendency toward individual units of large capacity.

One of the noticeable developments in generating apparatus is the elimination of the turbine direct-connected to generators of small capacities and substitution of the moderately high-speed geared turbine for both condensing and non-condensing operation. This has enabled the speed of the turbines to be increased to 3,600 or even to 6,000 r. p. m., with consequent gain in efficiency of approximately 10 lbs. of steam per kilowatt-hour, and also has permitted the use of lower speed alternating-current and direct-current generators and direct-connected exciters with better operating characteristics. During the past five years the new central stations and some of the reconstructed stations have installed low-capacity steam turbo-generators. The efficiency of the gears averages 97.0 to 98.5 per cent. The reduction in size of turbines, due to the high speeds which can be obtained through the medium of the gear, more than counterbalances the slight loss due to the gear. The generators of these units are built for high-speed operation, requir-

ing a gear reduction of from two to four.

The sale of large motors for steel-mill rolls was trebled over the sales of 1915. Automatic reversing mills were equipped with 15,000 h. p. motors. The complete equipment of these installations, and others of similar nature but of smaller capacity, consists of an alternating-current motor direct connected to a direct-current generator, which operates the mill motor. A heavy flywheel is direct connected to the shaft of the latter motor to carry the maximum loads at the time of reversing. The latter operation is accomplished automatically. Speed control is by automatic or hand control of the field of the generator which supplies the field of the motor.

There have been manufactured during the year more 60-cycle synchronous converters than ever before. Both lighting and railway service have been supplied by these machines. The Anaconda Copper Co. installed five 5,800 kw. converters for electrolytic work. These machines have 32 poles and run at 225 r. p. m. The Aluminium Co. of America is about to install a 6,825 kw. synchronous converter. This unit is rated at 36 cycles, 26 poles, at a potential of 500 volts. The Interborough Rapid Transit Co., New York City, placed an order for twelve 4,000 kw. converters for railway service. In general the year marks a reduction in number of poles and a corresponding decrease in armature diameter for this class of apparatus. Many improvements have been made in minor details.

An interesting phase of central-station development, brought on by the more general use of very high capacity generators with forced cooling systems, is the decrease in reserve storage-battery capacity required to take peak loads. The development in forced cooling systems for the generator and in forced draft for the newer types of steam boilers gives to the plant a short-duration overload capacity sufficient to carry all but the most abnormal peaks. This has resulted in a decreased expenditure for storage-battery equipment. The battery equipment, however, is still in use for emergency service and to supply this maximum peak. In connection with such battery operation the end-cell switches are motor controlled.

Central-station designers have developed a number of new safety devices for switchboard equipment. To facilitate inspection and safety in repairing, many of the switch elements, including the switch gear, oil tanks, panels and accessory apparatus, are mounted on a carriage and may be run out of their usual positions when a few minor disconnections are made. These disconnections, however, can be made only when the switch mechanism is "open."

Industrial establishments dependent on the water of Niagara Falls for the generation of electrical energy are bringing to the attention of a congressional committee a project whereby an increase in power may be developed with regulation of water flow at flood times. It is proposed to accomplish this by means of a submerged dam above the falls which will in no way affect the scenic grandeur of the falls, but rather add to the constancy of volume at periods of low-water flow. In this way both industry and surroundings will be improved.

Lighting and Illumination.—The art and science of illumination has shown marked advance in certain branches during the year. There have been extensive developments in the use of incandescent and arc lamps for projection of light for illumination of signs, public buildings and large areas for purposes of work or recreation. The various uses to which this comparatively new branch of lighting has been put are too numerous to mention.

Projection lamps, which had come into common use during the past 10 years, have now been developed until powerful beams may be projected 30 miles out to sea from the walls of coast fortifications. Some of the government lighthouses have recently installed automatic projectors which shift a new lamp into focus as soon as an old one burns out. This is done by means of electromagnets which automatically shift a three-arm socket bringing a new lamp into position and lighting this unit as the

old lamp burns out. The Government also has made extensive improvements in signal lamps and projectors for triangulation work of the Coast and Geodetic Survey. The major part of such development is in improvement in concentrated filaments in gas-filled bulbs.

The line of demarkation between search-lamps and so-called "flood lamps" is a narrow one. It has been customary to refer to a somewhat broadly illuminated surface as "flood-lighted," and this term became more common as the source of light became more and more concealed. Holding to this use of the term, we may give many instances of the use of the flood-lamp. Among the more important uses may be mentioned the illumination of the interiors of public halls, capitols and court houses; the illumination of public grounds of recreation and private grounds; the flood lighting of commercial buildings and office buildings, monuments, water courses, signs, etc. Pageant lighting, so well introduced by the flood-lamp illumination of the Panama Pacific Exposition, has come into common use for spectacular effects. Permanent illumination of the Statue of Liberty in the New York Harbor by an extensive battery of flood lanterns was inaugurated by President Wilson on Dec. 2. The Massachusetts State House, Boston, was illuminated by means of two batteries of 74 500-watt lamps. Color effects were obtained with gelatine films. A battery of 50 projectors of similar design furnished the illumination of the American Niagara Falls. The Sheepshead Bay automobile speedway of 160 acres is lighted by 224 projectors mounted on poles 100 ft. apart and 30 ft. above the track. The bathing beaches of Chicago are illuminated by projectors mounted on the roofs of the bath houses and on steel towers.

The year 1916 has been another period of development in the lighting of streets with incandescent lamps. There have been many multiple-circuit systems installed, although the series system is still in greatest favor. An increasing number of cities have installed "white ways" and in every case have felt well repaid in the expansion of business in the areas affected. Some representative installations are those of San Francisco, St. Louis, La Porte, Ind., Sheboygan, Wis., and Brockport, N. Y. (See also XI, *Lighting.*)

Progress has been made in the standardization of sizes of incandescent lamps. The 15, 25, 50, 75 and 100-watt ratings are now the standards in the smaller sizes. The 75-watt lamp is now the minimum capacity gas-filled lamp. Some trouble has arisen due to the lack of uniformity of filaments and their positions within the bulb, causing uncertainty of light-flux distribution from standard reflectors. The very high intrinsic brilliancy of the modern concentrated-filament lamps has made absolutely necessary the use of auxiliary shades and reflectors. A new type of gas-filled tungsten lamp giving the day-light spectrum has come upon the market. This lamp is used wherever "day-light" illumination is necessary. In dye works, tapestry mills, paint factories, silk mills, etc., the matching of colors, formerly done only during the day, may now be done either night or day by the use of these lamps. The process of manufacture of the glass which forms the diffusing cover of this lamp has been known for some time, but only recently has a lamp with the bulb of such glass been placed on the market. The glass has a bluish tint. The volume of light from the lamps is reduced only eight per cent. from that which would be obtained with the usual clear-glass bulb.

Arc-lamp development has been chiefly in the use of materials other than carbons for electrodes. An arc maintained between tungsten electrodes contained within a vessel of inert gas has come upon the European market and is in process of commercialization in the United States. This lamp has a life of 500 hours, and the arc develops an intrinsic brilliancy of 10,000 candles per square inch when operating at 0.5 watts per candle. A number of chemical salts have been tried in electrodes for the purpose of improving color and steadiness of the arc. Titanium oxide and sodium fluoride have been used to obtain a whiter arc, and the addition of barium fluoride has increased the

steadiness. Numerous improvements have been made in the operating parts but no marked departure from the standard mechanisms has been noted.

Special mention should be made of the numerous unique developments and uses of illuminants for the purpose of war. Many special miniature lamps for gun sights, for illumination of instruments on battleships, field-artillery and aeroplane instruments, have been developed. In contrast to the use of devices for illumination are the many curious screens, shades, reflectors and diffusers used for directing or covering the light sources from the sight of the enemy.

Legal restrictions in the United States on the use of excessively bright automobile head lamps has been an incentive to manufacturers of such equipment, and many improved lamps, shades, reflectors and dimmers have resulted. One lantern has been developed which is adjustable over wide ranges of focus and intensity. A novel automobile accessory is a celluloid hand modeled in the shape of its human counterpart and illuminated within by an incandescent lamp supplied from the batteries of the car. The hand is hinged near the side of the car next the driver and may be manipulated to give warning to other drivers in the rear.

Electric Traction.—There have been few additional main-line electrifications during the year (see also *Civil Engineering, supra*). The Chicago, Milwaukee & St. Paul electrification has been somewhat extended and another year of highly successful service has been recorded. The Butte, Anaconda & Pacific lines also have given economical and efficient service on the electrified sections. The chief field of progress in railway traction has been that of the medium- and low-capacity locomotives and motor-cars for switching and passenger service. Quick service, relatively heavy duty, and maximum tractive effort with minimum expenditure of energy have been the chief factors. The swivel-truck, 40-ton locomotive, driven by four 600-volt motors, operating in freight service, is a favorite type. This locomotive develops a normal tractive effort of 13,600 lb., and hauls 760 tons at eight miles per hour. This type is used on the Albany & Southern Railroad and the Ohio Valley Traction Co.'s lines. The Transit Development Co. of Brooklyn uses 55-ton locomotives with a rated tractive effort of 17,200 lb. at a speed of 20 miles per hour, for freight switching service. The Willamette Valley Southern Railway of Oregon, furnishing passenger service, uses 50 ton, 1,200-volt locomotives, developing a tractive effort of 14,800 lb., at a speed rating of 10.8 miles per hour. These are typical equipments for this kind of medium-capacity service.

The regenerative method of braking has been the most interesting phase of recent railway electrifications. This method provides for the generation of electric power, through the medium of the train motors, as the train descends grades which would ordinarily require the application of brakes. In the heavy freight service the cars are all "bunched" against the locomotive, the motors of which, then acting as generators, provide the braking power. This results in a smooth decrease in speed which is not obtainable with air-brake systems. On passenger service regenerative braking provides safety and comfort when the train is brought to a stop. A typical performance of a large electric locomotive was recorded on the Chicago, Milwaukee & St. Paul lines, when three steam locomotives coupled to 75 freight cars were moved from the main line to a siding to allow a passenger train to pass. This was early in the year when extreme cold weather had made the steam locomotive ineffective.

Single-phase service on three-phase systems has found extensive application, particularly in connection with railway work. The Philadelphia-Paoli electrification of the Pennsylvania utilizes two synchronous condensers for power-factor correction and voltage regulation. These condensers are unique in that they are operated as straight single-phase machines, on exceptionally high voltage. The voltage of the system is 11,000, the insulation of the windings being equivalent to that suitable for a 19,000-volt, three-phase, grounded-neutral system. The capacity of the condensers is 4,500 kv.-a. continuous rating, but they are

compelled to carry momentary peaks as high as 9,000 kv.-a. As has been the trend for several years, the use of the synchronous converter in preference to the synchronous motor-generator, has been very marked. Since the majority of the alternating-current lines are suitable for synchronous-converter application, practically the only excuse for the synchronous motor-generator is a desire to obtain needed condenser capacity for power-factor correction. In some cases it has been advantageous to install synchronous converters and separate condensers.

Telephony and Telegraphy.—The year 1915 marked the installation of successful radio-telegraphy over a distance of 4,900 miles between Arlington, Va., and Honolulu (*A. Y. B.*, 1915, p. 560). The powerful wireless stations of the United States, including the Arlington, Sayville, L. I., and Tuckerton, N. J., stations, have all communicated with domestic and foreign stations in regular commercial and diplomatic service over such distances during 1916. Little increase in maximum distance has been noted. Several railroads in the United States use wireless telegraph for communication with passengers and trainmen on moving trains. The Delaware, Lackawanna & Western Railroad provides an example of such an installation used for commercial purposes and for dispatching. The difficulties in trans-Atlantic wireless telegraphy, due to "static" disturbances, has caused considerable annoyance and delay during 1916, as it has in past years. The development of high-power transmitters and atmospheric-reducing equipments has done much to relieve the trouble, but wireless messages have been delayed by the necessity for slow sending during periods of atmospheric disturbances. Developments in the audion amplifier for receiving, and improvements in the generation of undamped waves for sending, have produced results which have facilitated communication and may later entirely overcome "static" interference. In radiotelephony it is necessary for long-distance transmission considerably to increase by some means the volume of the sound waves set up by the human voice. To aid in this a new form of a magnetic amplifier has been developed. This device makes use of the principle of varying an inductance by changing the permeability of the iron core of the transmitter. By inductive interconnection of the radio-frequency circuits, the voice currents are amplified.

Much has been accomplished during 1916 in reducing inductive interference on telephone circuits. Adjacent power lines usually provide the major part of the trouble. Investigations involving the transposition and spacing of both power lines and adjacent telephone lines have given results which materially reduce inductive interference. Heretofore the method has been to transpose only one of the circuits at certain intervals. It developed further that different systems of transposition were required for delta-connected, star-connected, and grounded star-connected power systems. Considerable study has been given to the question of protection of telephone circuits from lightning by protective ground wires suspended above the active circuits. Investigation showed that the electrostatic shielding afforded by this installation was productive of a great improvement in transmission of speech. Recent installations have justified all the theoretical considerations. Lightning protection by use of the ground wire has been in use for many years on power systems but little had been done in extending it to the telephone lines. In telephone-cable testing it is necessary to have daily tests on the intricate net work. For this purpose the human voice and ear have been used to prove the satisfactory condition of the lines for transmission purposes. A new testing device, designed to replace operators, consists of a tuned receiver having one resonance point within the range of the average human voice and a rhythmic interrupter to take the place of the human voice. The receiver is connected electrically to a galvanometer circuit which records the condition of operation.

About 135 railroads in the United States and Canada now use the telephone for dispatching. There seems to be a gradual tendency to use the

telephone instead of the telegraph for such purposes. In favor of the telephone method of dispatching are greater speed, simplicity of operation and recording, and greater accuracy in transmission.

Research and Invention.—The Newlands bill, now pending in Congress, has as its object the establishment of an engineering research station in each state. These stations are to be used for carrying on research, investigation and experiments looking toward the progress of the industries and industrial arts. It is proposed to appropriate $15,000 per year for each station. These stations should do much in the development of electrical engineering.

Under the direction of certain industrial laboratories, important research work has been done on the effect of altitude, temperature and humidity on the temperature rise of all types of electrical machinery. Particular emphasis has been placed on the rise of oil-cooled apparatus and further important tests are outlined for future investigations on rotary apparatus. The importance of this research depends on the fact that a factory test of a given machine at a given load is not indicative of the actual temperature rise at the place of installation if there is a considerable difference in altitude or average temperature. Humidity has little to do with the variations in temperature rise. Variation from factory test results has been the cause heretofore of much contention and litigation because of failure of guarantees due to the absence of available data on the variations due to altitude and temperature.

A great amount of detail work and research has been done during the year in the development of protective apparatus. No strikingly new apparatus has resulted but many improvements have been made in this field. The more important developments have been those on relays, quick-operating mechanisms on oil-switches, new designs in the air-brake and disconnecting switches and their locking devices. Particular emphasis has been placed on the importance of a rigid inspection of all high-voltage insulation. This has led to the adoption of frequent cleaning periods for all high-voltage transformer bushings, switchings, switch-gear insulators, and line insulators. In this connection a series of important tests have been made on all types of porcelain insulators, dealing with porosity, absorption of moisture, surface-leakage and dielectric losses, all of which affect the efficiency of an insulator.

A new meter for measuring high voltage has been developed. This consists of two concentric cylinders enclosed in an air-tight compartment in which the air pressure is variable. To measure the potential a high voltage is applied across the cylinders and the air pressure lowered until corona appears. A curve indicating the relation between air density and voltage at which corona appears is used to indicate the voltage measured. The readings are independent of wave form, frequency and electrostatic disturbances. It may be well to mention at this point that the needle-point method of high-voltage measurement is now almost wholly displaced by sphere-gap measurement. The latter affords a more consistent indication of potential, is less liable to disturbances due to moisture and dust particles, and the equipment is more easily handled. The application of the "kenotron" to the testing of certain classes of insulation has been of particular interest in the field of investigation and research. The "kenotron" is a vacuum-tube device which rectifies high-tension alternating current. The high-voltage direct current has recently been applied to the testing of paper and cambric insulated cables, in preference to the alternating potentials formerly used.

Little advance has been made in the development of new apparatus for the transmission and distribution of electrical energy. On the other hand there has been steady improvement in materials of construction, including all types of insulators, poles and transmission towers. One of the new inventions recently patented is a new conductor designed to prevent corona discharge and subsequent breakdown of insulation. At high potentials corona appears at a critical voltage for wires of given diameter. In the new design the virtual diameter of a con-

ductor of given cross-section of copper is increased by employing a reticulated conducting network, thus reducing the potential gradient at the surface of the conductor.

Industrial Applications.—The scarcity of high-speed tool steel caused by the great demand in this and foreign countries has made necessary the wide adoption of the electric furnaces for steel making (see also XXIV, *Electrochemistry*). The market price of tool steel has jumped up 700 per cent. in the last year. Much of this product is used in the metal-working machines for the manufacture of small and large guns and projectiles. Predetermined analysis of all grades of steel had always been uncertain until electric furnaces were utilized. Through their use the process is materially simplified, requires less skilled labor, insures a uniform product easily duplicated, and provides a "batch" of molten metal far in excess of the capacity of the old coke or gas furnaces. Furnaces are now made in capacities up to 25 tons, providing molten steel of uniform mixture and at temperatures for making castings much higher than were feasible with the smaller capacities. The following table gives a comparison between the number of large electric furnaces in use in this and foreign countries during the last five years and illustrates the added demand for them:

	United States	Foreign Countries
1912	10	104
1913	19	121
1914	43	172
1915	73	230
1916	100	250

The largest electric range ever made has recently been assembled and placed in service in the Montana State Hospital, Warm Springs, Mont. The equipment consists of eight ovens, complete with broilers, hot plates, grills, toaster, kettles, frying pans, baking pans and other minor accessories. The range has in its ovens a roasting capacity of 190 chickens or 640 lb. of beef. It was designed to cook three meals a day for 1,500 people. After a careful comparison of the cost of cooking with gas, coal and electricity, the latter was chosen as the basis of economy and has already justified the choice. The total orders for electric ranges for the year 1916 exceeded in value $2,000,000. In many sections of the country the rate per kilowatt-hour for heating and cooking is three cents and below. Over 3,300 communities have rates below five cents per kilowatt-hour for this class of service.

An interesting and extremely practical development has been that of a suction street sweeper. It consists of a tractor driven by a 7.5-kilowatt 125-volt generator direct connected to a four-cylinder, four-cycle marine gas engine. This generator also drives a sweeper motor and a motor connected to the vacuum pump. A trailer carries the dust-separating mechanism and dirt container. A typical performance removed 1,628 lb. of dust and 6,580 lb. of litter, etc., from 27,290 sq. yds. of old brick pavement in one day. Five miles of paved streets per day at a speed from two to six miles per hour is the usual duty. This device no doubt will eventually replace the old expensive, unhealthy and inadequate methods of street cleaning.

In line with the general tendency towards efficiency in factory production there has recently been developed a device for recording periods of operation, or duty cycles, of various industrial machines. The novel feature is that all of the recording "pens" consist of calorite wires which become heated and scorch marks on a revolving chart whenever the recording circuits are closed. A clock mechanism revolves the chart. A maximum of 375 machine operations may be recorded at one time.

The demand for X-ray apparatus has increased 200 per cent. over that of 1915. There seems to be a more general use of the X-ray by the physicians of this and foreign countries. The foreign trade has been due to the great number of cases arising because of the war. An improved X-ray tube has been patented in which the cathode rays impinge tangentially on the rim of a wheel-shaped electrode which revolves under the impact. The overheating and melting of the electrode is thus avoided.

In connection with the operation of steel-mill machinery by the electric

motor, it has been shown that the initial investment required for motor drive with purchased power is less than for steam driving equipment. This is true even in the case of privately owned generating plants. Energy consumption in the electrically operated reversing mills is only 50 to 60 per cent. of that required for corresponding steam mills.

The increasing use of the automobile for business and pleasure has developed a demand for electrical auxiliaries greater than ever before. Approximately $10,000,000 worth of small dynamos for automobile lighting sets have been sold during the year. The number of gasoline and electric vehicles manufactured during the year will reach close to 1,500,000 and few of these are without dynamos for starting and lighting purposes (see also *Automobiles, infra*).

For some time the possibilities of electricity for heating purposes in place of the coal-fired radiator systems has been considered. A recent series of tests on the heating of a medium-sized home by electricity was made. The water or oil was heated by electric coils and circulated through the ordinary radiator systems. The tests bear out the generally accepted idea that electricity, at its present cost, is uneconomical for general heating of large rooms. It was shown that a rate of one-half cent per kilowatt-hour would place electricity on a par with coal-fired systems for general heating purposes.

In general the electrical horsepower used for industrial purposes throughout the United States has increased during the year. The figures for 1915 showed approximately 20,100,000 h. p. used in the more important industries, while the horse power in use at the end of 1916 totals nearly 28,000,000. The following table gives a close estimate of the horse power distribution at this time:

Manufacturers	17,700,000
Street and electric railways	6,800,000
Mines and quarries	1,700,000
Flour, grist and saw mills	900,000
Irrigation	450,000
Automobile	280,000
Total	27,830,000

MECHANICAL ENGINEERING

Calvin W. Rice and Leon Goldmerstein

New Materials and Processes of Engineering.—The European War has created an industrial situation in some respects very remarkable by cutting off Germany from the rest of the world and the rest of the world from Germany, and by creating a tremendous demand for certain materials, products and forms of labor simultaneously with a material reduction in the supply of at least some of these commodities. Germany in particular felt a scarcity of copper. Hence, the German Society of Electrical Engineers has promulgated new standards and specifications for certain electric machinery using zinc instead of copper for conductors, and already it is predicted that some of this machinery will continue to use zinc or similar material (aluminium) even after the reëstablishment of normal conditions of economic intercourse. Another material for which the war with its stupendous production of munitions has created an unprecedented demand is tungsten, which has been hitherto a basic constituent of tool steel. We are informed, however, that a new steel, the constitution of which has not been announced, has been developed in England, which, though containing none of the rare metals, has characteristics fully comparable with those of high-speed steel.

Not materials only but the methods of using them have been thoroughly revised and often reformed. The rapid rise in the cost of practically every material, whether raw or manufactured, and in some cases, especially in Europe, a great scarcity of the materials because of the lack of bottoms for their transportation have made intense economy the watchword of the year. In France they have found that the use of superheaters on locomotives has saved for the French railroad system a million tons of coal a year, and there is no doubt that future locomotives will be equipped whenever possible with superheaters. In England and in this

country the beehive coke oven has decisively given place to the by-product oven with its possibility of recovery of such valuable items as benzol, ammonia products and coal-tar derivatives (see also XXIV, *Industrial Chemistry*). The rise in the price of gasoline, which is simply expensive in the United States and scarcely obtainable even for money in England, France and Germany, has led to intensified search for methods of burning substitute fuels, benzol and alcohol in Germany, kerosene in England and America; carbureters have been developed which promise to bring kerosene engines within the reach of wide commercial application on a par with gasoline engines (see also *Automobiles, infra*). The scrap heap has become an item to which careful attention is paid, and several types of balers have been developed to take care of iron filings, waste paper, rags, etc. Plants which formerly sold all their scrap by the ton have now installed magnetic separators to take out the valuable copper and brass filings and shavings. With the rise in the cost of fuel a wider use of indicating and measuring instruments in plants is observed everywhere. Production is becoming not only more economical but better understood, through the effort to detect leaks, sources of waste and sources of possible savings.

Another very significant tendency which appeared during the year in the establishment of plants for the production of munitions of war is the practice of planning for the days of the coming peace. Thus an American company which recently built a very large plant for shell forging laid it out with the view of converting it to other work as soon as the demand for shell forging ceases. This practice is becoming more and more the rule, in this country especially, partly because of the prevailing impression that the day of extremely large orders for munitions has passed, and partly because the prices now paid are not such as formerly would permit of depreciating the entire plant from one order.

This account would not be complete without mention of a new force which has been brought into the field of machine work by stress of war conditions. This force is woman labor. With the men in the field or engaged in occupations requiring great expenditures of muscular force, recourse was had to woman labor. So far this is true mainly of the countries at war, although a start has been made in the same direction even in the United States. It has been found that women can do quite well a good deal of the work in shops which men used to do, that they are easy to handle, conscientious, and, on the whole, able to turn out very creditable work. The employment of woman labor, however, has created a demand for increased automaticity of production and for an increased use of safety appliances, as well as for greater attention to sanitary conditions in shops and gentler methods of handling labor. It is a very serious question for the future whether the shops will be able in the next generation to dispense with woman labor, a question, however, which will be decided more on social and economic grounds than from the point of view of engineering. One thing, however, may be considered as absolutely certain; that is, that a good many of the conditions created in the shops by the employment of women, however temporary, will remain even after men take their places. The shops have become, and let us hope will stay, cleaner, safer and better places to work in than they were before.

The war by its magnitude, by the vital importance of the issues involved, and by the unprecedented number of people directly or indirectly affected by it, has forced the nations to tremendous sacrifices and placed them face to face with a multitude of complicated problems which had to be solved at no matter what cost. Under the stress of necessity whole new industries have been created; new branches of engineering, such as heavier-than-air flying, have been developed with an undreamed-of rapidity; and in meeting these problems the world has learned new methods of production and new methods of engineering thrift. It will not forget them; and while we must deplore the reason and the cost of the lesson, one cannot help feeling that the war

has been a great lesson to humanity, out of which it will come wiser, and perhaps better.

Steam Engineering.—A significant tendency in the field of fuel utilization is exemplified by the formation of the fuel-economy committee of the British Association for the Advancement of Science, to consider the subject of fuel economy from a national standpoint. The committee, to judge from a paper presented by its chairman, Prof. William A. Bone, before the Society of Chemical Industry, has a very interesting programme. It proposes in the first place to undertake experimental research on the chemical character of coal, about which we are still comparatively ignorant. An intensive development of by-product utilization is also under consideration.

Great progress has been achieved during the year in the burning of powdered coal, success in which may now be considered as fully realized in several important fields of power generation. Not only have successful types of powdered-coal locomotives been produced, but in open-hearth furnace work the introduction of powdered coal has helped to evolve an entirely new type, fired at one end and operated without regenerators (see also XVIII). A furnace of this type has been built and successfully operated at a plant of the American Iron & Steel Manufacturing Co. This application, however, is still dependent to quite a large extent on the personal equation of the operating force. As regards powdered-coal firing generally, it has been clearly established that the best efficiency is obtained with an amount of air just sufficient to supply the amount of oxygen necessary for complete combustion (Joseph Harrington, *Jour. Am. Soc. Mech. Engs.*, October, 1916). Further, the experience of railways has shown that practically any solid fuel which in a dry pulverized form has two-thirds of its content combustible is suitable for steam-generating purposes. In fact, no difficulty was found in maintaining maximum boiler pressure on a locomotive with semi-bituminous coal from Brazil with a sulphur content of from three to nine per cent.

Important progress has been made in burning under boilers fuels not hitherto used in this way. The Toledo Railway & Light Co. has to burn under its boilers nine million cubic feet of coke-oven gas per day. At the Lucerne Mines power plant a 12,000-kw. capacity steam-turbine plant is to be operated on bone fuel. Coke breeze is another low-grade fuel successfully used.

An interesting investigation of the precision of instruments for recording carbon dioxide in flue gases has been carried out at the laboratory of the U. S. Bureau of Mines. In the search for greater economy and efficiency increased attention is beginning to be paid to a proper organization of the firing service. In this connection it may be recalled that in 1907 300 firemen were specially trained by the officers of the Hamburg Society for the Prevention of Smoke, and it was found that with untrained firemen a thermal efficiency of 66.6 per cent., and with trained firemen, of 72.7 per cent., was attained. A still more striking difference was shown in the tests conducted by the Pennsylvania Railroad Co. at Altoona, in which a locomotive boiler showed an efficiency of 73.2 per cent. with trained firemen and of 59.7 per cent. with inexperienced men.

In the field of steam engineering proper the most important development is probably the tendency to use higher and higher pressures. Robert Cramer, in a paper before the American Society of Mechanical Engineers, has shown that increasing steam pressures to 600 lb. per square inch absolute results in material gain in efficiency, and the only problem is how to obviate the mechanical difficulties involved in the design of engines and turbines for such steam pressures. It is clear, however, that even in the existing state of the art, higher pressures may be used than those which are now common. An exemplification of this tendency may be seen in the boilers designed for plant of the Ford Motor Co., carrying a superheat up to 350°.

Comparatively little work has been done in the physics of steam. A clear understanding has been reached as to the value of data presented by

indicator diagrams. Among other things it has been shown that logarithmic analysis introduced for this purpose a few years ago cannot be applied under all conditions. On the other hand, there are indications that the temperature-entropy diagram may be more widely used in the future than it has been so far.

Railroad Engineering.—The draft-gear committee of the Master Car Builders' Association has presented an important report on tests made to determine the maximum end force which could be put on the end frames of freight cars without overstraining them. It is the opinion of the committee that a draft gear is needed which will absorb enough of the energy to keep the pressure down below the elastic limit of the sills. Though not stated in the report, the data presented show that a very great saving can be made by using a draft gear of greater ability to do the work instead of increasing the weight and strength of the car end frames so that both the lading and the superstructure have to suffer.

A clearer idea of the equalization of long locomotives has resulted from the report of a committee to the convention of the American Railway Master Mechanics' Association held at Atlantic City in June. This report presents formulae which make it possible to devise systems of equalization for locomotives of the less complicated types now in use, and also formulae as to loads on supports for locomotives of the Mogul, consolidation, decapod, and American types. These formulae make it possible to determine accurately the weight distribution of any properly designed locomotive. The report also brings out the fact that there are locomotives in service in this country in which the spring rigging has not been properly designed, and that these locomotives require constant attention to see that the different axles carry the proper weight.

In the YEAR BOOK for 1915 (p. 571) it was stated that "the large steam locomotive continues to be of paramount interest." This statement is equally true for the year 1916. The Philadelphia & Reading has placed in service for the first time on that road five locomotives of the Pacific type to haul heavy passenger trains in very fast service. These locomotives weigh in working order 273,600 lb., and have a limit of 60,000 lb. of load on each pair of driving wheels. The Norfolk & Western, to take care of its heavy passenger service, has built eight mountain-type (4-8-2) locomotives capable of taking trains of 11 steel cars over grades with a rise of 84 ft. to the mile at a speed of 30 miles an hour. These locomotives develop 57,200 lb. maximum tractive effort.

The application of the Mallet engines for use in road service continues to extend. The Baltimore & Ohio has recently received from the Baldwin Locomotive Works 15 Mallet articulated locomotives of the 2-8-8-0 type, capable of exerting a tractive effort of 103,000 lb., which are to be used on the Cumberland Division having maximum grades of 2.4 per cent. one way and 2.28 per cent. the other way. The traffic in this section is very heavy, consisting chiefly of coal, and on few roads in this country are more difficult operating conditions to be found. The new locomotives are to replace single-expansion locomotives of the 2-10-2 type which have been transferred to a section of the road having lighter grades.

The Mallet locomotives in the recent past encountered powerful competition on the part of the heavy, simple, non-articulated engines of the Mikado and Santa Fe types. This was because the Mallet locomotive is so arranged that one set of cylinders uses high-pressure steam and the other set usually uses low-pressure steam. When a heavy grade is reached or an exceptionally large draw-bar pull is required, high-pressure steam is admitted into the low-pressure cylinder. This operation is similar in intent to the shifting of gears from high to intermediate in automobile driving. The change from low-pressure to high-pressure steam used to be effected by means of special intercepting valves, but until lately these valves have been so expensive and troublesome in installation and operation that in some cases the Mallet locomotive lost to its more simple, though somewhat less efficient, competitors. Recently,

however, the Lima Locomotive Corporation has built for the Western Maryland Railroad 15 Mallet-type engines provided with a form of valve, claimed fully to meet the requirements, which is not only quite simple but is so arranged that it is possible to operate the engine with reduced tonnage even with the intercepting valve removed.

Not only in locomotives but in cars as well is the tendency to build larger and larger units prominently displayed by American railroads. The volume of traffic, especially in heavy staple commodities, is gradually becoming so tremendous that it pays to build vehicular means of truly enormous dimensions. The 50-ton hopper car has been standard now for several years. In 1912 the Norfolk & Western made a big stride forward by building a few 90-ton high-side gondola cars. A couple of years ago, however, the Pressed Steel Car Co. built for the Woodward Iron Co. Railroad of Woodward, Ala., cars of 100-ton regular capacity, and the data which have become available as to their operation clearly indicate that such cars under proper conditions can be operated quite successfully. The first year that one of these cars was in service it handled 11,800 tons of coal with no repairs whatever except in air-brake hose.

This enormous enlargement of both driving and hauling units presents not only an engineering problem in methods of building such units successfully, but creates the still more difficult problem of handling them economically on the road.

The following table, taken from the reports made to the Interstate Commerce Commission, indicates the increase in average tractive power and in average number of tons of freight per train load during the 11 years from 1904 to 1915:

	Increase in Average Tractive Power, Per Cent.	Increase in Average Number of Tons of Freight per Train Load, Per Cent.
Road A.....	43	78
Road B.....	40	72
Road C.....	30.7	72
Road D.....	29	54

For every ton-mile of freight hauled a certain amount of coal has to be shoveled into the furnace, and as this amount per trip became very large, some roads using heavy power have found serious difficulty during the summer months in retaining experienced firemen in service. It became apparent that if the heavy-tonnage trains were to be a success and the cost of operation held to a reasonable minimum an "iron fireman" was an absolute necessity. Hence, mechanical stoking has been developed during the last year or two to a high degree of perfection and may be now considered to be sufficiently standardized for wide commercial application.

But when locomotives and trains reach weights and power outputs of such gigantic proportions, even with the "iron firemen" the problem of generating sufficient steam to take the trains over the road on schedule is quite a formidable one. The locomotive boiler is in no case larger than is absolutely necessary, and in the majority of cases it is insufficient in evaporative surface. Hence, the only way to increase steam generation is by the intensification of the boiler's work. In the last couple of years this has been done largely first, by adopting the superheating of steam, and, second, by the introduction of brick arches in the boiler furnace. While the use of brick arches is not new, their purpose has fundamentally changed in the last couple of years. Formerly they were used to reduce the fuel consumption for the same power output; now they are installed to get more power without increasing the fuel consumption. The introduction of the superheater has brought about the rapidly growing use of pyrometers on locomotives, the temperature of superheated steam being too high to be measured by an ordinary thermometer.

It becomes more and more clear what the locomotive of tomorrow will be. It will be an immense structure probably exceeding the present size in the next couple of years by about 15 per cent. It will have a superheater not adapted to the existing dimensions as at present, but designed and built as a part of the whole, which means that the flues will be different

from those now used. All the stoking will be done by mechanical means, pulverized coal being used as a fuel. The locomotive will carry, besides the usual instruments, a pyrometer to tell the degree of superheat, an indicating instrument to tell the temperature of the water, a speed-indicating device, and very likely a grade-indicating device, an instrument which so far has not been yet used in railroad engineering.

Automobile Engineering.—The year has been an unusually busy one for the American automobile builders (see also *Automobiles, infra*). With the demand for cars far in excess of what the industry could deliver, and the public apparently ready to take anything that will run, it would appear that conditions were not promising for engineering advancement. Actually, however, a large amount of valuable work has been done and important progress achieved.

The year 1915, with its introduction of the eight- and twelve-cylinder engines, solved the problem of supplying uniform torque. It is the rule, however, that when a new way of doing anything is invented, it does not immediately displace the old way entirely but rather creates an effort to improve the old way to such an extent as to give it a new lease of life. This happened with the six-cylinder engine. The eight and twelve were far more powerful than the six, but the six could be improved by eliminating vibration and raising the possible output either by increasing the number of revolutions per minute or by eliminating side-thrust losses due to vibrational phenomena. Both of these methods have been resorted to with apparently gratifying success. The Chalmers company placed on the market a six-cylinder car in which the engine can be run with perfect safety up to 3,400 revolutions, while the Hudson Motor Co. has introduced a balanced crank shaft of peculiar design and has thereby increased the output of the engine for the same piston displacement by about 80 per cent. An attempt has been made also to combine the economy in fuel consumption of the six cylinder with the power of the twelve. The Enger Company has recently placed on the market a car with a twelve-cylinder engine, six cylinders of which can be cut out by a lever placed on the steering column.

The experience of the year further has illustrated the possibility of using aluminium engines in commercial cars, a question about which there was some doubt a couple of years ago.

The interrelation between the aeroplane and racing-car engine and the higher-grade pleasure-car engine has been still more emphasized during the year. The Packard Motor Car Co., which of late has done a considerable amount of work in developing aeroplane engines (*A. Y. B.*, 1915, p. 574), have finally developed an aeronautical twin-six which has been tested on a racing car and the design of which has materially and favorably affected the design of their twin-six automobile engine. The Stutz Motor Car Co., mainly known as builders of racing engines, have placed on the market a pleasure car with a 16-valve motor, a type which a year or two ago was known only as a racing motor. The same was done by the White Motor Co.

Aeronautical Engineering.—During the year the development of heavier-than-air machines continued most vigorously, mainly, if not exclusively, through the demand for war purposes. This development has been in two directions. In the first place, the machines have been made very much simpler than before. All unnecessary complications and all freakish refinements of design have been ruthlessly eliminated with the coming of a clear understanding of the relative importance of the parts and the work to be done by them. The creation of a large market for flying machines has taken their construction out of the hands of "inventors," that is, experimenters, and placed it in charge of engineers having at their command all the wide experience in other lines of mechanical construction and a thorough knowledge of the materials used. While in Europe, at least, no attempt at standardization has been seriously made as yet, the fact that the machines have been simplified has paved the way for standardization in the future. In the United

States a different method appears to be followed. The Army, although it contemplates the purchase of only a small number of machines, is seriously engaged in the work of standardization. This is stated also to be one of the prominent activities of the aeronautical branch of the recently created Society of Automotive Engineers.

Recent experience has led also, especially in England and France, to a considerable lowering of the factor of safety of aeroplanes, from the usual former value of 12 to a value varying between four and six. This was due to two causes. In the first place, a factor of safety of 12 has been found to be excessive and unnecessary under any conditions; it represented not so much a desire actually to insure safety by such a wide limit as a lack of confidence in our knowledge of the stresses developed in the machine and its ability to withstand them. The second reason for a reduction of the factor of safety is a very practical one. A factor of safety as high as 12 could not be obtained without inordinately increasing the weight of the machine, and that meant reducing its speed, range of action and climbing capacity. But the reduction of these properties reduced the flying ability of the machine and thereby endangered the aviator. Hence, in the end, a reduction of the factor of safety actually made the machine safer; here the mechanical factor of safety had to give way to the military factor of safety.

No fully authentic information is available as to the size of the present machines, as all the governments are keeping their designs secret. It is known, however, that the size of seaplanes has increased enormously since 1915. As to the land machines, it is known that machines are used which carry three guns, one of them a Lewis rapid-fire gun and the other two either machine guns, also of the same type, or single-pounder rapid-fire guns. It is easy to see that a machine able to do this and to carry the necessary quota of men and ammunition must be of large size and high power. Still larger sizes are employed in seaplanes. The Curtiss company (U. S.) is building machines equipped with four engines having a total output of 1,000 h. p., and planes even bigger and more powerful than these are said to be used by the British Navy.

Comparatively little is known of the undoubted progress in the construction of lighter-than-air machines, especially of the rigid type. Several announcements have been made of the British Admiralty having built such machines, but no authentic information about them is available. The Germans continue to build machines of the Zeppelin type and have succeeded in increasing both the dimensions and the speed. From the information available it appears that material changes have been made in the design of the machines. The stern of the latest airships has been given a more pointed form and the fineness ratio has been reduced. Judging from photographs of wrecked airships, the envelope does not have the parallel sides that characterized the earlier Zeppelins, but is given a gradual curve all the way from stem to stern, somewhat after the fashion of the Schuette-Lanz airships. As to size, examination of the wreck of the LZ-77 reveals that this vessel was about 540 ft. long, with a displacement of over 1,110,000 cu. ft., which would furnish a total lift of about 33 tons. It appears also that the modern Zeppelins carry one engine in the front car and three engines in the rear car instead of the former two sets of two engines. There are also good reasons for believing that the water ballast has been considerably increased in the new airships. As loss of buoyancy cannot be made up entirely by jettisoning ballast, it is likely that some means, possibly a system of compensating balloonets or use of waste heat from exhaust gases, have been devised for remedying this defect on new airships. (See also *Aeronautics*, *infra*.)

Refrigeration Engineering. — The comparatively young and essentially American industry of making raw-water can ice has received considerable development during the year. In addition to the low pressure system several high pressure systems have been developed so that it is possible now to obtain can ice of uni-

form transparency and good taste and flavor.

Considerable progress has been made also in the understanding of the operation of refrigerating and cooling machinery. From the work done in the research laboratory of physical chemistry of the Massachusetts Institute of Technology, new equations for ammonia have been developed, and it is expected that in the near future tables based on the new experimental data will be issued. The same investigation covered the determination of the water pressure of the liquid to the critical point, the specific volume of the liquid to pressures of 100 atmospheres and to 200° C., the specific volumes of the vapor in the superheated region, and the specific-heat capacity of the liquid.

H. Torrance has carried out a series of tests on ammonia condensers, the data of which, together with other information published during the year, are of interest in that they bring into question the supposed greater efficiency of the flooded condenser. In fact, it appears that the introduction of liquid into a condensing gas under certain conditions retards rather than facilitates condensation, which would militate against the principle on which the flooded condenser is based and on which its supposed superiority is predicated.

A continuation of what promises to be a very interesting investigation on the theory and performances of cooling towers has been published by B. H. Coffey and G. A. Horne. It has already given some data, though not yet sufficient for developing a general theory. Considerable work has been done, however, in the determination of the constant θ which is the total heat loss per hour per square foot of surface per mercury-inch difference of pressure between the value of the function ω at the cooling surface and at the wet bulb, this difference in the value of ω being the measure of the total heat loss from the cooling surface to the atmosphere. Evaluation of this constant is of great importance because it makes it possible to apply the theory in its present form to any tower employing film-cooling surface exclusively, and with this form of surface the wetting in contact with the atmosphere can be accurately calculated.

Scale Construction.—The building of measuring instruments, while requiring an unusual amount of engineering skill and perseverance, does not as a rule attract the attention of the general public. Sometimes, however, an apparatus is constructed which may well be considered as a landmark in the development of measuring instruments. To this class belongs the immense track scale recently installed at West Albany, N. Y., by the New York Central Railroad Co., undoubtedly the largest track scale in the world. It is 100 ft. in length with a 90 ft. weighing rail, has a total weight installed of about 300,000 lb., is built in six sections, each of which is designed for a concentrated load of 275,000 lb., thus giving a lever system capable of sustaining a load of 1,650,000 lb. The scale has been built of sufficient length and capacity to weigh the largest locomotive or car built at the present time or that is likely to be built for many years to come. In tests made of this scale with two test cars weighing respectively 80,000 lb. and 60,500 lb. a variation between sections was established of less than 10 lb., and when both cars were used, that is, with a test load of 140,500 lb., the sensibility reciprocal was only 20 lb., a highly creditable showing for the accuracy of a scale of these very large proportions.

High-Speed Machinery.—Towards the end of the eighteenth century, James Watt, the inventor of the steam engine, wrote a letter concerning a project of developing a steam turbine. He saw clearly that the whole success of the machine depends on the possibility of "prodigious" velocities and summed up the matter in this way: "In short, without god makes it possible for things to move 1,000 ft. pr′ it can not do much harm," that is, impossible competition with his own engine. Since then man has achieved and surpassed the velocity of 1,000 ft. per minute which seemed so prodigious to Watt. The De-Laval turbine runs at 30,000 r.p.m. A still further step was taken in 1916 when a single-stage blower was built in this country to consume from 350

to 400 h.p. and to run at speeds up to 60,000 r.p.m. While machinery running at such high speeds has been built before, this is one of the first attempts to build high-speed apparatus of such size. To give an idea of the difficulties this may involve, it is stated that the pull on one of the blades of the blower rotor, which were only about 1/16 in. thick by an average of 11/16 in. wide and 2 in. long, amounted to a little over a ton, though the actual weight of one blade is about 1/40 lb.

Dynamics of Fluids.—An important paper on the flow of air through nozzles was presented by Capt. Thomas B. Morley before the Institution of Mechanical Engineers (Great Britain). The data obtained in his investigation made possible a comparison of the discharge and velocity attained with various nozzles with those calculated from the ordinary theory in which reversible adiabatic expansion is assumed. The investigation covered also the nature of the impact produced by a jet upon a flat plate and its relationship to the reaction of the jet. It was found that with nozzles and orifices of proper form, the efficiency as measured by the mean velocity of the jet produced is very high indeed, becoming practically unity. An approximate mathematical expression for the system of stream lines set up by a jet has been found and data calculated indicating that a jet from a nozzle is paraboloidal in shape, while its cross section is about proportional to the distance along its axis.

That natural gas does not flow exactly according to Boyle's law has been generally known for a long time. A paper presented by Robert F. Earhart and Samuel S. Wyer before the American Society of Mechanical Engineers reports data of an extensive investigation establishing the nature of the deviations. It was found that Boyle's law when directly applied to high-pressure natural-gas measuring problems gives only an exceedingly rough approximation. Different gases have marked peculiarities and marked differences of deviation. Furthermore, there is no direct relationship between the deviation and the ethane content.

Considerable attention has been paid during the year to phenomena of flow of various materials in pipes, partly in connection with transmission problems and partly because of the extending use of oil as fuel. Data of an extensive experimental and mathematical investigation on surface friction with special reference to the flow of steam and water in pipes were presented to the Royal Society of Great Britain by Cecil H. Lander. It was found that the resistance to the flow of fluids does actually vary as the square of the velocity up to a certain limited value of the roughness of the pipe surface. Further direct evidence has been produced to demonstrate the truth of the dimensional law which has now been shown experimentally to extend to the case of saturated vapors. The present investigation, by demonstrating the truth of the law of dynamic similarity as applied to the flow of steam and water in pipes, opens up an important possibility of inferring according to the law of similarity the resistance of complicated steam passages such as are met with in turbines, from comparatively simple tests and models. These experiments are of particular interest also because for the first time a range of pressures was used extending from about 15 in. of vacuum to 200 lb. per square inch above atmospheric pressure.

The laws of turbulent flow in pipes and channels form the subject of a paper published by Prof. L. V. King in the *London, Edinburgh and Dublin Philosophical Magazine* (April, 1916). It has been generally assumed that the theory of viscosity for the case of flow in a pipe of circular cross section obtains its application to reality in that the equation for the total flow derived in this case contains all the laws found experimentally by Poiseuille. Actually, however, as Professor King shows, a marked deviation is easily noticeable as soon as the diameters exceed a few millimeters, even at velocities considerably below what is taken to represent the critical velocity.

The stability of laminar flow in pipes and channels was investigated also. A series of experiments on the

flow of air made by means of a new instrument called the linear hot-wire anemometer indicate the existence of hitherto unsuspected conditions of laminar flow both at extremely low velocities and at velocities much higher than those usually taken to be critical velocities. Owing to the high resolving power of the new instrument, it was found possible to measure velocities at intervals of 0.05 mm. over the cross section and it was found that even at velocities considerably below the critical velocity, as usually defined, the distribution curves showed consistent deviations from the shape (parabolic) demanded by theory. A significant fact appears to have been established by this investigation, namely, that the factor of compressibility of the fluid is of considerable importance in determining the conditions of stability of laminar flow, which causes all the various previous theoretical treatments of this important engineering phenomenon to lose a large part of their value.

An investigation of the flow of oil through orifices was carried out at the laboratory of the State University of Iowa, in which it was determined that at each pressure there is a temperature above which the discharge of oil through an orifice becomes independent of the temperature and below which the discharge drops off at an increasing rate with the decrease in temperature. These critical temperatures decrease as the pressure increases. This again points to the fact that no matter what kind of oil be used, the discharge from a given orifice with a given pressure will be always the same if the oil be at or above its critical temperature.

An important investigation on the viscosity of oils in relation to the rate of flow through pipes has been carried out by the National Physical Laboratory at the request of the British Admiralty with a view to determining the laws of flow of oil in drawn steel pipes of varying sizes. This information was necessary to establish how far the pressure difference required to produce a given flow could be calculated from a knowledge of the dimensions of the pipe and of the viscosity of the oil. It was found that the ordinary laws of viscous flow hold so long as the velocity of flow is less than the critical velocity (approximately 2,500 ft. per minute), beyond which point the flow becomes turbulent.

AUTOMOBILES

JOSEPH A. ANGLADA

The Automobile Industry. — The number of cars and motor trucks in the United States on July 1, 1916, numbered approximately three million, the exact number with all duplications taken out being 2,932,455. The average state increase over Jan. 1, when there were 2,423,788, was 21 per cent. The first ten states in rank of motor cars registered and their numbers are:

	Number	Increase, Jan. 1 to July 1, per cent.
New York	259,105	22
Ohio	208,705	16
Illinois	203,757	12
Pennsylvania	189,082	25
California	187,519	14
Iowa	169,558	21
Michigan	132,000	15
Minnesota	122,000	33
Indiana	111,121	20
Massachusetts	105,488	18

Florida showed a gain of 90 per cent., Oklahoma, 80 per cent., Nevada, 79 per cent., and Arkansas, 59 per cent.

The history of the Ford Motor Co. is typical of the growth of the automobile industry. The latest figures on production from the Ford factories serve to emphasize what has been said previously in this connection, that it pays better than anything else to do but one thing and do it well. For the fiscal year ending in 1916, the organization turned out 533,921 machines, valued at $235,000,000, a daily average of 1,816 machines. Incidentally the same plant will raise this average to more than 2,500 by producing 750,000 cars for 1916-17. Ford plans to bring out a one-ton worm-driven truck at a price in the neighborhood of $500, building 200,000 of these in the year 1917. The growth of this Ford organization is

well worth study. The company was organized on June 16, 1903, with a capital of $100,000. In that year it employed 311 men. The present capital is $2,000,000 and in 1916 it employed 31,035 men. The following table is of interest:

Year	Output	Daily Average[1]
1903–4	1,708	5
1905	1,695	5
1906	1,599	5
1907	8,423	28
1908	6,398	21
1909	10,607	35
1910	18,664	62
1911	34,466	115
1912	68,544	228
1913	164,452	545
1914	248,307	827
1915	308,213	1027
1916	533,921	1816
1917	750,000[2]	

[1] Three hundred working days were used in computing daily average

[2] Estimated output, to which should be added 200,000 trucks.

Automobile Design.—The use of trailers in connection with automobiles has increased to a remarkable extent during the year. It has been found by experiment that the truck, like the locomotive, will pull many times as much load behind it as can be loaded upon it. The truck, however, needs some load to give it sufficient traction, thus making it more efficient than the relatively heavier locomotive.

The application of aluminium to cylinder castings has been proved to be entirely practical and in keeping with the aims of the manufacturers to reduce the weight of cars and thereby gain lowered cost of operation and increased road ability. The use of stamped sheet-metal parts has increased and is bound to continue to increase at a rapid rate, because of the economies of manufacture resulting from the substitution of drawn and pressed sheet-metal parts for relatively heavier forgings and castings. The use of all-metal wheels on commercial vehicles is an important development of the year and it is logical in view of recent developments to expect the entire elimination of the wood wheel in favor of the metal wheel on cars of all types. (See also *Mechanical Engineering, supra.*)

Fuels.—The use of kerosine as a motor fuel has received more attention during the year on the part of engineers than during any similar period since the advent of the automobile. The success of these experiments has not been all that has been anticipated, because up to date the carburetors which have been developed for handling this heavier hydrocarbon, leave much to be desired on the part of the exacting motorist, the chief difficulty encountered being nonreliability of performance as compared with machines using gasoline. According to a report from a reliable French source, coming through Switzerland, the Germans are now using as motor and aeroplane fuel a mixture of alcohol distilled from beets and benzol produced from coal tar. With the cessation of imports of gasoline into Germany, the supplies of petroleum drawn from wells in Galicia proved inadequate for the needs of the Central States. The German Government instructed the technical department of the transportation service to seek a combustible that would effectively replace gasoline. The outcome of these experiments was the employment of the mixture of alcohol and benzol. A Mercedes car of the 1914 touring model, having an ordinary carburetor, was used for experimenting purposes, and the following results were obtained on some of the test runs made on the alcohol-benzol mixture:

Alcohol-Benzol Mixture	Speed, miles, per hour	Distance covered on one pint of fuel, miles
1 part benzol, 1 part alcohol	42	4.66
1 part benzol, 2 parts alcohol	41	4.47
1 part benzol, 3 parts alcohol	39	4.34
1 part benzol, 4 parts alcohol	38	4.10
1 part benzol, 5 parts alcohol	36	3.72
Benzol, pure	42	3.79
Gasoline, pure	44	3.60

Even if the alcohol be figured at before-the-war prices the use of such a mixture is an economy. One pint of gasoline costs 8.55 cents, and of benzol, 8.17 cents.

AERONAUTICS

J. C. Hunsaker

The Aeroplane Industry.—The industrial development of the year 1915 has continued through 1916. Existing aeroplane factories have been enlarged and new factories started. European war orders combined with large orders for aeroplanes placed by the War and Navy Departments have made it easy to attract capital for aeroplane factories and many such have been started without regard to the technical difficulties involved. Skilled aeronautical engineers in the United States are so few that it is not possible for every factory to have a technical expert, with the result that while the industry has become well equipped to produce existing types, their perfection and development is seriously handicapped by lack of engineers skilled in the art of aeroplane design.

The patent situation has not cleared with the acquisition of the Wright patents by the newly incorporated Wright Co., subsequently merged with the Martin Co. to form the Wright-Martin Aircraft Corporation. Until the patent litigation (Wright *v.* Curtiss) is settled, aeroplane building in the United States appears to be attended by considerable risk. In December the Wright-Martin Corporation announced that it proposed to issue licenses only to such companies as would pay a royalty of five per cent. on gross business, with a minimum guarantee of $10,000 yearly. The Curtiss Corporation is expected to demand a royalty of the same amount.

From the standpoint of industrial preparedness for war, the continued growth of the American aeronautical industry is very encouraging. During the year, for example, two great motor factories have been turned over to the manufacture of two famous French aeroplane motors. The equipment for the construction of such motors in the United States is a real addition to the national defense.

Aeroplane Design.—The year's progress in aeroplane design has consisted largely in the development of the types defined in this review for the year 1915 (*A. Y. B.*, 1915, p. 576). The "tactical scout" has been further developed by decrease in size with marked increase in speed and rate of climb. In this type an effort has been made to go to the extreme. The most noteworthy example is a one-man triplane brought out by Curtiss. The triplane arrangement for the wings makes it possible to build a 100 h. p. aeroplane with a span of about 25 ft. It is reported that a maximum speed of 120 miles per hour was made by this aeroplane and that an altitude of 10,000 ft. was reached in 10 minutes.

The large "bomb-carrier" type has been developed by several firms as a twin-motored aeroplane and the expected difficulties of a twin-motor installation are not found to be so serious as expected. The aeroplane can be flown and controlled in the air with one motor stopped. The increased power obtained by duplicating the power plant has given a very satisfactory rate of climb but unfortunately appears to give no material increase in radius of action. The twin-motored aeroplanes have in general a large lateral moment of inertia, due to the location of the power plants, and consequently the aileron control has demanded more force for its operation than can be exerted comfortably by a man of ordinary strength. Servo motors operated by a wind vane have been employed frequently, but manual control for aeroplanes of weight up to 6,000 lb. is feasible where control surfaces are partially "balanced." The Army and Navy of the United States have formally adopted as standard the form of control known in France as the "Deperdussin." This control provides a wheel for operating the lateral control, and has been adopted largely because of the mechanical advantage it gives the pilot. In the twin-motored aeroplanes this control is found to be especially helpful.

The European War has lent abnormal stimulus to the development and abandonment of new types. Early in the year the enormous "gun carrier" filled the official press notices. Later the type appears to be rarely mentioned and the "tactical-scout" type, such as the Sopwith and the Fokker,

seem to have the ascendancy. More recently, bombing raids are described "under convoy of gun carriers." The swing of interest from one type to another has been reflected in aeroplane construction in the United States. The probable situation at the present time is that each type is necessary but no one type is sufficient for all duties. The "all-round" military aeroplane is generally recognized as impossible.

Naval aeronautics in the United States have been affected by the European War to a less degree, which is not essentially a naval war. The Navy Department has purchased seaplanes varying from 100 to 400 h. p. and with single, double and triple pontoons and flying-boat systems of flotation. There appear to be at least three types which may develop after further experience in service, but it is premature at this time to attempt to distinguish them.

Technical progress is marked by the construction of aeroplanes of structural steel by the Sturtevant Aeroplane Co.; improved instruments for aeroplanes, including automatic devices to relieve the pilot, by the Macy Stabilizer Co. and the Sperry Gyroscope Co.; light alloys by the Aluminium Co. of America; kite balloons for observation purposes by the Goodyear Tire and Rubber Co.; reduced motor weight by more extensive use of aluminium for cylinders and pistons by nearly all motor builders, and the elimination of unstable, underpowered and structurally weak types of aeroplanes. (See also *Mechanical Engineering, supra.*)

Scientific Progress.—During the year much interest has been taken in aeronautical research, and aerodynamical laboratories are being built by the Curtiss Aeroplane Co., Buffalo, University of Illinois, University of Washington and Leland Stanford University. Alexander Klemin and T. H. Huff have been appointed instructors in aeronautical engineering at the Massachusetts Institute of Technology. A technical journal of great promise was launched Aug. 1, entitled *Aviation and Aeronautical Engineering*, which should afford a much needed medium for the publication of technical papers. This journal is edited by L. D. Gardner with Mr. Klemin as technical editor. The first 24 issues will contain in condensed form a "Course in Aeronautical Engineering" by Messrs. Klemin and Huff.

The National Advisory Committee for Aeronautics (*A. Y. B.*, 1915, p. 579) has continued to publish its reports from time to time upon matters of interest and has undertaken to propose a standard nomenclature for aeronautics in which the word "aeroplane" is banished for the new "airplane" and many terms necessarily borrowed from the French are anglicized. The Committee has been granted an appropriation of $85,000 by Congress for an experimental laboratory. Changes in personnel are as follows: president, Prof. W. F. Durand, *vice* General Scriven; member of executive committee, Col. G. O. Squier, *vice* Col. Samuel Reber.

Professional papers of interest are:

Hunsaker, J. C.—"Dynamical Stability of Aeroplanes." (*Smithson. Misc. Coll.*, July, 1916.)

——. "Stable Biplane Arrangements." (*Engineering*, Jan. 7, 1916.)

—— and Huff, T. H.—"Aerodynamical Properties of the Triplane." (*Engineering*, July 21, 1916.)

Jones, B. Q.—"Relative Position of Propeller Axis, Center of Gravity, etc." (*Aviation*, Nov. 1, 1916.)

Wilson, E. B.—"Theory of an Aeroplane Encountering Gusts." (*Proc. Nat. Acad. Sci.*, May, 1916.)

Zahm, A. F.—"Periodic Stresses in a Propeller." (*Aerial Age*, Sept. 26, 1916.)

Records and Flights.—The Curtiss Flying Trophy was won in 1916 by Victor Carlstrom, who flew 661 miles in less than 10 consecutive hours on Aug. 25, in a twin-motored aeroplane equipped with floats. Carlstrom on Nov. 2 and 3 made a flight from Chicago to New York in an actual flying time of 8 hours 28½ minutes, not counting two stops. The first leg of the journey, 452 miles from Chicago to Erie, Pa., was made in 4 hours, 17½ minutes, constituting a new American non-stop record. This record, however, was broken a short time after by a non-stop flight of 590 miles from Chicago to Hornell, N. Y., by Miss Ruth Law in an antiquated biplane. This flight was a part of a Chicago-New York trip, with two stops, Nov. 20 and 21, made in an actual flying time of 8 hours, 55½ minutes.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

DANIEL H. COX

Shipbuilding.—The demand for tonnage caused by the conditions resulting from the European War has placed the shipyards of the United States in a condition of extraordinary prosperity. Not only have all of the shipyards which were in existence before the war on the Atlantic and Pacific coasts and on the Great Lakes taken all the orders that they can fill for 18 months ahead, but these yards have in many instances largely increased their building facilities, and many new shipyards have sprung into existence and taken orders for a large amount of tonnage.

A most interesting development has been the revival of the wooden shipbuilding industry. Owing to the very high cost of steel and the impossibility of securing reasonable delivery of plates and shapes, shipowners, attracted by the fact that wooden vessels could be built at about one-half the cost and within one-half the time of steel vessels, have placed large orders for wooden tonnage. These wooden vessels are being built not only in the old yards along the New England coast, but new yards have sprung up along the Gulf ports and on the Pacific coast, where the low price of lumber has made the conditions particularly favorable.

The demand for tonnage has been so acute that practically every available vessel has been forced into service. Many vessels on the Lakes have been brought to salt water and converted for ocean traffic, and old ships which were thought to have outlived their usefulness have been repaired and pressed into service. Of all this additional tonnage but a small proportion is for passenger service, tank ships for carrying oil in bulk forming the greater portion of the new construction, the balance being freight vessels designed for different trades, of various types and sizes. Practically all of the wooden vessels are sailing craft with auxiliary power designed for coastwise service, although some of the larger wooden vessels are practically full-powered ships, generally with Diesel or semi-Diesel engines, intended for trans-Atlantic trade.

Not only is the building of commercial vessels being carried on with great activity, but the new naval programme is the largest in our history (see also XII, *The Navy*). The lessons of the European War have shown the necessity of more and larger ships of the line, battle-cruisers, destroyers and submarines, many of each being included in the vessels authorized by Congress. The tendency of naval design is as usual leading towards vessels of greater displacement and speed, heavier armor and more powerful guns. The limit in dimensions of ships of war seems no nearer than in the case of passenger vessels, which, until shipbuilding was suspended on account of the war, were successively larger and larger.

The phenomenal demand for vessels is caused by the enormous destruction of tonnage by submarines and mines, by the withdrawal of vessels into Government service, by the practical cessation of mercantile shipbuilding in the countries at war, by the internment of a large number of ships, and by the enormous demands on this country for shipments of general supplies and war material to Europe. The following extracts from the annual address of Stevenson Taylor, president of the Society of Naval Architects and Marine Engineers, give some interesting facts regarding the status of shipbuilding, the facts being carefully compiled from accurate reports:

The year 1909, with a production of 1,602,057 tons, represents low tide, and the year 1913, with 3,332,882 tons, the high tide; therefore the five year period, 1910-1914 inclusive, fairly represents the average annual production of the shipyards of the world. This average was 2,740,000 tons gross. The launchings of the leading nations were approximately as follows:

	Per cent.	Tonnage
United Kingdom	60	1,650,000
Germany	12	330,000
United States coasts and Great Lakes (rivers not included)	9¼	253,000
France	4½	121,000
All other countries, including Great Britain's colonies and Canada	14	385,000
		2,740,000

In the year ending June 30, 1915, the entire tonnage of the merchant vessels of the world amounted to 49,262,000 tons, distributed as follows:

	Per cent.	Tonnage
United Kingdom	43.5	21,300,000
United States (excluding rivers and small lakes)	12	5,900,000
Germany	10	5,000,000
France	5	2,300,000

Taking the greatest tonnage of merchant vessels launched by any nation in any one year of all the years 1899 and including 1915, and combining same, we have a fair estimate of the capacity of the world's shipyards. These figures give a total capacity of 3,687,000 tons, of which the United Kingdom, colonies and Canadian Lake ports launched 54 per cent., or 1,984,000 tons; United States coasts and Great Lakes, 14.6 per cent., or 540,000 tons; Germany, 12.4 per cent., or 465,000 tons; all other countries, 19 per cent., or 696,000 tons.

We have seen that the greatest production (the measure of capacity) of the world's yards up to 1915 was 3,687,000 tons. We estimate that in the year 1918 the capacity of the world's shipyards will be about as follows:

	Tonnage	Per cent. increase
United Kingdom, colonies and Canada	2,260,000	14
United States coasts and Great Lakes	826,000	53
Germany	605,000	30
All other countries	809,000	16
Total	4,500,000	23½

The normal tonnage of the world this year amounts to about 50,000,000 tons. Of this there has been a tonnage:

Destroyed	5,000,000
Commandeered	12,000,000
Interned	4,400,000
Total withdrawn	21,400,000

Leaving available at present for regular service not more than 28,600,000, or 57.2 per cent. of the normal tonnage, which readily accounts for the present high freights and high values placed on all vessels.

Presuming that peace will be restored by the end of 1917, we have:

Present available tonnage as above		28,600,000 tons
Commandeered and interned ships released		16,400,000 "
Probable production in year 1917		3,000,000 "
		48,000,000 tons
Less future destruction, scrapping and depreciation		4,000,000 "
Leaving an available tonnage of		44,000,000 tons
At the end of 1918, should peace be restored, there will certainly be required		55,000,000 tons
Available at end of 1917, as above	44,000,000	
Estimated construction 1918	4,500,000	
		48,500,000 "
Still leaving a tonnage deficit at end of 1918 of		6,500,000 tons

At present the shipyards of the United States are building nearly 1,500,000 tons of steel and over 50,000 tons of wood vessels to be finished during the next two years. Of these at least 500,000 tons are for foreign account, and from reports recently received this tonnage will be increased, so that about one-third of the vessels now contracted for in this country will fly foreign flags, mostly the flag of Norway.

Marine Engineering.—The development of marine engineering has continued along the lines indicated in the last issue. For installations of considerable power, the geared turbine is being more and more extensively used. Many new concerns are being equipped for cutting gears and the various manufacturers of marine turbines are all working to full capacity. Electric drive is probably to be used exclusively in the new battleships and battle cruisers, the Navy Department believing this method of propulsion superior to any other for its requirements. There seems no indication of this power being generally introduced on account of the high cost compared with other types of engines. The use of fuel oil continues to become more and more universal. Unless there should be some indication of a shortage in the supply of fuel oil, it would seem that in the future nearly all marine boilers will be oil fired. This method of producing steam, provided the cost of oil is not prohibitive, has immense advantages over coal—uniform steaming, increased evaporation for a given boiler, lessening in number of crew, greater steaming radius, etc. The demand for oil engines has resulted in their increased manufacture in this country during the year. Large numbers of imported Diesel and semi-Diesel engines are being installed in many of the smaller steel and wooden vessels now nearing completion, while for vessels of moderate size and power now being ordered, the power in many instances will be full

Diesel engines of American design and manufacture. The cost of manufacture of this type of engine is now being reduced, making it possible for the ship owner to take advantage of the extreme economy in fuel secured by the Diesel principle.

Submarines.—During the year not only has the submarine attracted much attention due to its activities as a naval weapon, but much interest has been shown in the spectacular performance of the German submarine cargo vessel *Deutschland*, which made a successful initial voyage from Bremen, reaching Baltimore on July 9 and in October made another voyage from Bremen to New London. The details regarding dimensions, nature of construction, speed submerged and afloat, and possible cargo-carrying capacity of this vessel are naturally difficult of exact determination, and the various reports published have been exceedingly conflicting. In this connection the following quotation from *The Submarine Torpedo Book* by Allen Hoar is interesting:

> To those familiar with this type of craft there is nothing remarkable in just the mere mileage covered by the *Deutschland* on this voyage, but the performance of this vessel is spectacular because it has succeeded in leaving a well blockaded port and traversed waters abounding in hostile craft undetected to the end. It is very difficult at this time to obtain any exact or reliable information as to the real dimensions of this vessel. It has been variously given out in widely conflicting statements, purporting to have been uttered by Captain Koenig, as from 200 to 315 ft. in length, 20 to 30 ft. in breadth and from 1,000 to 4,000 tons in displacement. There seems to be little doubt, however, from what reliable information can be had, that this vessel is of the same general type as those submarines laid down by Germany in the early part of 1914, the principal characteristics of which are given in the appendix, as 214 ft. in length, 20 ft. beam and 900 tons submerged displacement. A boat of this size, if stripped of all torpedo tubes, torpedoes and handling gear, and with weight of power plant restricted to a capacity for 14 knots on the surface and 10 knots submerged, would afford a net cargo tonnage of about 75 to 100 tons. This is a practical illustration of the possibilities for new uses of the submarine as a blockade runner on Government enterprise.

Owing to the extremely limited possibilities for carrying cargo in this type of vessel, it is evident that their use in a commercial way is only possible under such conditions as exist at the present due to the state of war in Europe, and that the only cargoes which may be carried are those of extremely high value and requiring small stowage capacity.

PHYSICAL PROPERTIES OF METALS AND ALLOYS

James S. MacGregor

Importance of Fabricating Methods.—Technical papers published in 1916, reporting the results of experiments having to do with the physical properties of metals and alloys, reflect the increasing recognition of the fact that fabricating methods frequently have more to do in determining physical characteristics than has chemical composition. Specifications for this class of materials are imposing stricter conditions relative to the details of manufacture.

Aluminium Bronze.—William R. Gorse and G. F. Comstock (*Proc. Am. Soc. Test. Mats.*, xvi, 1916) report the results of a series of tests on bronzes and discuss their significance. Tension and endurance tests with the Landgraf-Turner and White-Souther machines made upon specimens of manganese bronze and aluminium bronze indicate that although manganese bronze has greater tensile resistance, aluminium bronze is superior in enduring alternating stresses. The Eighth Report of the Alloys Research Committee of the British Institution of Mechanical Engineers is quoted as checking their results, and as also explaining the combination in aluminium bronze of a low yield point in tension and high endurance to alternating stresses. The authors describe in detail a method of heat treatment by means of which the proportional limit of a 10 per cent. aluminium bronze is materially raised without great loss of ductility.

Brass.—A paper on "Recrystallization of Cold Worked *Alpha* Brass on Annealing," by C. H. Matthewson and Arthur Phillips (*Bull. Am. Inst. Min. Engrs.*, Jan., 1916), reports the results of an extended series of experiments on a 70-copper: 30-zinc brass

having low impurities. The authors (1) show by physical tests the general direction and magnitude of changes induced by heating cold-rolled strips below an effective annealing temperature; (2) determine the periods of time necessary to produce a measurable amount of softening in one kind of strain-hardened material using temperatures below the regions of rapid effects; (3) give the microscopic aspects of strain-hardening and recrystallization in metal which has received both light and heavy reductions by rolling; (4) show the relations between temperature, time of anneal, degree of alteration, and structural alteration in *alpha* brass; and (5) give comparisons between the ordinary physical properties and grain size when taken as functions of the annealing temperature for a fixed period of anneal. The tabulated results are too extensive for presentation here. The research is one deserving of careful study by metallurgists and those interested in the manufacture and use of brass products.

Brass Condenser Tubes.—The results of a series of experiments conducted on brass condenser tubes with the view of discovering an explanation for the splitting which is found to take place in condenser tubes in service, will be found in a paper by A. E. White (*Proc. Am. Soc. Test. Mats.*, xvi, 1916). The experiments seem to indicate that the cause of splitting could not be laid to the chemical composition of the tubes but is due rather to faulty manufacture. It is stated that excessive pinching during drawing, with insufficient annealing between drawings, are responsible for the trouble. If a tube is drawn too much, or if a tube is drawn properly but not sufficiently annealed, the metal is caused to be in a state of molecular strain and its effort to return to a condition of equilibrium is said to result, in the course of time, in a fracture or split. In an appendix the paper gives a specification which embodies the requirements of mechanical manipulation during manufacture. This specification has been in use by certain industrial concerns and its enforcement is claimed to have resulted in the overcoming of the difficulty above cited.

Cast Iron.—A paper on "The Physical Properties of Foundry Iron" by J. E. Johnson (*Met. Chem. Engng.*, xv) outlines very comprehensively and in minute detail the effects on physical characteristics of the various chemical elements common to cast iron.

Corrosion.—A new apparatus for the conducting of corrosion tests is described in a paper by F. N. Speller (*Proc. Am. Soc. Test. Mats.*, xvi, 1916). The author has developed a service test for determining the relative resistance to one kind of corrosion of iron and steel products, this to take the place of the "acid test" which has in many instances been found to give misleading results. The conditions of the test practically duplicate those common to water- and steam-pipe service. The elements effecting corrosion in the service are as cited:

(1) The amount of free oxygen in solution in water.
(2) The volume of flow.
(3) Temperature. Corrosion increases directly as the temperature of the circulating water up to 160 to 180° F., in which zone the maximum effects are noted.

The depth of pitting due to corrosion in wrought-iron and steel pipe used in high-duty hot-water systems is sometimes as great as 0.1 in. after two years' service. The apparatus can be operated to duplicate this depth in one-eighth of that time.

Steel.—"Influence of Thickening on Tensile Tests," an article by G. W. Waterhouse (*Iron Age*, April 13, 1916), reports a series of tests made upon specimens of basic open-hearth and acid Bessemer steel, the variation in thickness of specimens being from 0.307 in. to slightly over one inch. The results for open-hearth steel exhibit a decrease in resistance with increase in thickness up to about 0.6 in. Subsequently the resistance is practically constant. The elastic limit, however, continues to drop in value beyond a 0.6 in. thickness. These results confirm earlier experimental evidence.

The Bessemer steels give results quite at variance with what has commonly been assumed as true. The decrease in ultimate resistance with increased thickness is almost negligible.

The elastic limit shows but a slight variation. The author believes that the residual phosphorus of Bessemer steel has a greater influence on the tensile properties of the steel than the variation in gauge.

Sulphur in Basic Steel.—A paper by J. S. Unger (*Trans. Soc. Auto. Engrs.*, 1916) reports a number of experiments made upon Bessemer steel in which the sulphur content was increased in more or less uniform increments from 0.032 to 0.230 per cent. These steels were rolled into various shapes, such as sheet, wire, rivets, channels, rails, etc., which were tested for strength and elasticity, hot and cold working, machining, case hardening, and other properties. The author believes, and his tests seem to confirm, that a great deal of unjust prejudice exists against sulphur in steel, that steel with a sulphur content as high as 0.1 per cent. is not necessarily bad. A number of tables giving the results of physical tests are embodied in the paper.

Influence of Some Elements on the Mechanical Properties of Steel.—A paper by J. E. Snead (Iron and Steel Inst., Sept. 22, 1916) presents the results of investigations made to determine more especially the influence of phosphorus and sulphur on the mechanical properties of steel. The following table gives some of the results obtained:

	Effect of 0.1 per cent. Carbon	Effect of 0.1 per cent. Phosphorus
Yield point raised, tons	1.78	2.5
Ultimate resistance raised, tons	4.18	2.4
Elongation reduced, per cent.	4.35	0.7
Reduction in area reduced, per cent.	7.40	1.5

Carbon has a greater effect than phosphorus in reducing the ductility of steel. Dr. Snead stated that he did not defend the use of high-phosphorus or sulphur steels. He believes that these elements should ordinarily be reduced to the lowest possible limits, but that for certain purposes phosphorus and sulphur are useful. Certain of these steels are being sold in England.

Silicon Alloy Steels.—In investigations reported by Henry B. Hibbard, U. S. Bureau of Mines, the author finds silicon steel containing 2 per cent. of carbon may be rolled if the silicon content is less than 7 per cent.; with 0.09 per cent carbon, can be rolled with silicon less than 5 per cent. The presence of silicon is stated to elevate the elastic limit to a slight degree in structural steels. It also lowers the coefficient of expansion of steel, as nickel does. Silicon alloy steels are used largely for automobile springs and have been found to give excellent service.

Other Researches.—Other important researches published during the year are the following:

Arnold, J. O.—"Relations Between Brinell and Scleroscopic Hardness and Cutting Efficiency of Tool Steel." (Iron and Steel, Inst., May, 1916.)

Bristel, F. J.—"The Changes in Physical Properties of Aluminium with Mechanical Work." (Faraday Society, 1916.)

DeForrest, A. B.—"Some Experiments on the Plastic Elongation of Iron." (*Proc. Am. Soc. Test. Mats*, xvi, 1916.)

Howe, Henry M., and Levy, Arthur G.—"Notes on the Hardening and Temper of Eutectoid Carbon Steels and the Shore Test." (*Ibid.*)

Moore, Henry F., and Seely, F. B.—"The Relation Between Yield Point and Proportional Limit in Various Grades of Steel." (*Ibid.*)

Rowdon, Henry S.—"Microstructural Changes Accompanying the Annealing of Cast Bronze." (U. S. Bur. of Standard Technological Paper 60, 1916.)

White, A. E., and Wood, H. F.—"Recrystallization as a Factor in the Failure of Boiler Tubes." (*Proc. Am. Soc. Test. Mats.*, xvi, 1916.)

Young, C. D.—"Heat Treatment of Carbon Steel Locomotive Axles: Water versus Oil Quenching." (*Ibid.*)

XXII. MATHEMATICS AND ASTRONOMY

MATHEMATICS

E. B. Wilson

The National Societies.—It was mentioned in the Year Book for 1915 (p. 583) that there was under way the organisation of a new national association to specialize in the field of collegiate mathematics. At the meeting of the American Association for the Advancement of Science at Columbus, Dec. 30-31, 1915, the new society was formally brought into existence under the name, Mathematical Association of America, and under these officers: Prof. E. R. Hedrick (Missouri), president; Profs. E. V. Huntington (Harvard) and G. A. Miller (Illinois), vice-presidents; and Prof. W. D. Cairns (Oberlin), secretary-treasurer. The Association took over the *American Mathematical Monthly* as its official journal. The reception accorded the Association at the hands of the mathematical teaching public in American colleges was remarkably favorable, for in less than a year the membership in the Association has risen to over 1,100, some 50 per cent. greater than that which the American Mathematical Society (primarily a society for research) has attained in its 25 years of existence.

The Association had its first summer meeting on Sept. 1-2 at the Massachusetts Institute of Technology, Cambridge, at which over one hundred persons were in attendance. The programme consisted of the following addresses: "The Teaching of Elementary Dynamics," by Profs. E. W. Huntington (Harvard) and L. M. Hoskins (Stanford); "The History of Mathematical Recreations" by Prof. D. E. Smith (Columbia); "Combined Courses in Mathematics for Freshmen," by Profs. J. N. Van der Vries (Kansas) and F. S. Woods (Mass. Inst. Technology). By a mathematical recreation is meant a problem proposed and discussed primarily as an intellectual curiosity. Such problems are the construction of magic squares, the knight's path on the chessboard (it being required that starting from some square the knight shall light upon each of the 64 squares once and only once and return to the original square on the 64th move), and the arithmetical triangle of Pascal. Professor Smith pointed out that many of the standard problems in elementary algebra today originated, at least in type, far back in the days when algebra was as yet but poorly developed, and were in those days mathematical recreations.

The American Mathematical Society held its summer meeting at Harvard, Sept. 4-8. In addition to a large programme of scientific papers by various authors, there was a colloquium consisting of two series of lectures, one by Prof. O. Veblen (Princeton) on "Analysis Situs," the other by Prof. G. C. Evans (Rice) on "Theory and Application of Functionals," two of the most advanced and important subjects of research in present-day mathematics. The meeting marked the 25th year of the Society; an especial effort had been made to secure a large attendance in recognition of this anniversary, and the attendance both at the general sessions and at the colloquium was highly satisfactory.

Scandinavian Mathematics.—It had been planned to hold at Stockholm, in September, the sixth of the international quadrennial congresses of mathematicians. As European con-

ditions precluded an international congress, the Scandinavian mathematicians met by themselves.

Dr. G. Mittag-Leffler (Stockholm), who for a long time has been the leader among Scandinavian mathematicians, announced upon his 70th birthday, March 16, 1916, that he and his wife had made a joint will leaving their large fortune to found the Mittag-Leffler Mathematical Institute. The Institute is to preserve and increase the large mathematical library of the founder; it is to grant scholarships for study both at home and abroad to young persons of both sexes who belong to the four Scandinavian countries and who have shown real aptitude for research and discovery in pure mathematics; and it is to give prizes without distinction of nationality to persons who have made the most important discoveries in pure mathematics. The emphasis upon pure, as distinguished from applied, mathematics is intentional; for the founder believes that pure mathematics is very important to the advance of a nation, and that, apart from specialists, few persons understand this importance. This foundation marks a great epoch not only for Scandinavian mathematics, but for pure mathematics the world over.

Gravitation.—For some years A. Einstein and others have been engaged in building up a theory of gravitation (*A. Y. B.*, 1913, p. 614) with the aim of uniting gravitational and electromagnetic phenomena into an organic whole, as Maxwell united electric, magnetic and optical phenomena. It is almost impossible to get satisfactory information from Germany, but it appears that Prof. D. Hilbert (Göttingen) has just written a memoir on the foundations of physics in which he comes to the conclusion that electromagnetic phenomena may be regarded as a consequence of universal gravitation, when the latter is presented in the generalized manner of Einstein. To a certain extent the work is a unification of that of A. Einstein and of G. Mie. The mathematics is too complicated for explanation here. Moreover, as yet there appears to be little or no physical basis for the theory; our physical experiments and astronomical observations are not sufficiently precise to furnish proof or disproof of the work. As a piece of mathematical analysis and of physical hypothesis or speculation, however, it must rank high until it passes from the speculative into the proved or disproved. (See also XXIV, *Physics.*)

Personal Notes.—Prof. G. A. Bliss (Chicago) was elected in 1916 to the National Academy of Sciences. Dr. George Sarton, of Ghent, Belgium, has been lecturing at Harvard on the "Origin and Development of Greek Science" and on "Principles of Mathematics Historically Considered." Hon. Bertrand Russell (Cambridge, Eng.), the philosopher, known for his work on the foundations of mathematics, was to have lectured at Harvard but was detained at home. It is announced that for the year 1914-15, 23 doctorates were awarded by our universities to students of mathematics, of which nine were granted by Chicago.

The following deaths should be noted: J. W. R. Dedekind (Braunschweig), Feb. 12, aged 83, known for his work on the theory of numbers; Webster Wells (Mass. Inst. Technology), May 23, aged 65, an author of many widely used elementary texts; E. Mach (Vienna), Feb. 22, aged 78, known in this country particularly by his *Science of Mechanics*, etc. (Open Court); K. Schwarzschild (Potsdam), May 11, aged 42, astronomer, physicist, and mathematician; Don José Echegaray (Madrid), Sept. 15, aged 83, mathematical physicist, poet, and dramatist; W. C. Esty (Amherst), July 27, aged 78, an early student of quaternions; Emory McClintock, July 10, aged 76, first president of the American Mathematical Society, actuary and vice-president of the Mutual Life Insurance Co.; F. W. Frankland, July 24, aged 61, New Zealand mathematician, actuary, and philosopher; Josiah Royce (Harvard), Sept. 14, aged 60, philosopher and mathematician; E. H. Harper (Cork), a pioneer in the mathematics of aviation (*A. Y. B.*, 1915, p. 583), killed in aerial service in France; L. L. Conant (Worcester Tech.), Oct. 11, aged 59; P. Duhem (Bordeaux), mathematical physicist and historian, in September, aged 67.

ASTRONOMY

R. S. Dugan

Observatories and Instruments.—A gift of $60,000 for an observatory and 36-in. telescope has been made to the University of Arizona. The new observatory at Wesleyan University in Middletown, Conn., was dedicated in June. The director proposes to devote the researches with the 18.5-in. telescope chiefly to the photographic determination of the distances of stars. The movement of the earth about the sun allows the observer to view the stars from positions in space separated by the diameter of the earth's orbit, or nearly two hundred million miles. With this base line it is possible to detect minute relative displacements of the nearer stars, and thus triangulate their distances.

Plans and specifications for a perturbation machine have been drawn up by Sundmann. The calculation of the changes in position of a planet or asteroid caused by the attraction of the masses of other planets for its own mass, the effect of the attraction varying as it does with the ever changing distances and directions, is exceedingly laborious. A mechanism which can be adapted to the widely differing conditions and which will automatically indicate and register the resulting perturbations must be appallingly complicated.

Planets and Satellites.—W. H. Pickering, who has been observing for several years on the island of Jamaica, is giving in *Popular Astronomy* a series of reports on Mars, together with general information and inferences concerning the planet. From observations made during the oppositions (closest approach to the earth) of 1913-14 and 1915-16, he finds that the North Polar snow cap attained its maximum diameter in the latter part of Martian February, the cap extending some 200 miles farther south in the latter opposition. This apparently colder winter has been followed by an unusually late development of the Syrtis "marsh and vegetation." Since 1911, a band, stretching across the disk from north to south, has been observed. This band, in November, 1915, about 300 miles in width and covering over a million square miles of surface, is apparently a new feature. Many changes in shape and position of well known markings are being observed.

Great observational difficulties are met with in attempts to determine the brightness of the sun and moon, and to a lesser degree, that of the planets, whether the method of observation is by comparing them with each other or with a standard artificial light. The main difficulties arise from the brilliance and large apparent size of these bodies. Russell has discussed the measures that have been made by a variety of methods, and adopts values which lead in part to the following interesting facts. The sun is 465,000 times as bright as the full moon at its average distance. A standard candle at a distance of one mile would appear about as bright as the North Star. The full moon is 8.7 times brighter than the moon in first quarter, and 10 times brighter than in last quarter. This difference in the brightness of the moon at the two quarters is plainly attributable to the fact that there is a greater total area of the dark patches or "Maria" on the part of the disk visible at last than at first quarter. The full earth is 40 times as bright as the full moon. The reflecting power of Venus and that of the outer planets is comparable with that which would be expected from cloud surfaces, that of Mars, Mercury and the Moon, which have little or no atmospheres, is similar to that of ordinary rocks; while the reflecting power of the earth lies between these two extremes.

The curious and interesting fact has been worked out by Plummer that the poles of the orbit planes of the eight planets of the solar system lie three by three on five straight lines, and that the pole of each orbit, with the exception of Neptune, lies on two of these five lines. A star-shaped figure, whose sides represent the planets, can be drawn to represent, by their intersections, the planets whose poles lie on each line. Whether this configuration is stable is not yet

known. As an unexplained fact of observation it is in a class with Bode's simple rule giving with fair approximation the relative mean distances of the planets from the sun. (*Monthly Notices Roy. Astron. Soc.*, lxxvi, 377.)

The Sun.—The customary method of attack on the problems presented by the sun is being prosecuted with the usual vigor at observatories equipped for this work. Investigations concerning any mutual effect of displacement of neighboring spectral lines have been made, and the discussion of whether anomalous dispersion is a potent factor in the observed displacement of lines observed near the limits of the sun still continues. Sun-spot activity, in accordance with expectations based on the well-known 11-year cycle, has been very pronounced during the year. A spot was observed in December, 1915, about 30° from the south pole of the sun. No other spot has ever been observed in such high latitude. They appear in the greatest numbers within a few degrees of the equator. An interesting and elaborate work on the *History of the Discovery of the Solar Spots*, by Walter M. Mitchell, has been appearing in *Popular Astronomy* during the year.

The spectroscopic determination of the rates of rotation of various parts of the sun's surface has been coöperatively worked upon for some years by several observatories. In 1910 the International Solar Union assigned a region of the spectrum to each observer participating in the investigation and certain lines to all the observers in common. The early reports showed very large differences in the results of different observers. At the Bonn meeting it was decided that the observers should confine their observations for the present to the sun's equator and to a certain few lines of the spectrum, with a view to investigating the sources of these systematic differences. Plaskett, one of the observers, after improving the instrumental conditions to a point where he regards the results as free from observational errors, has detected two variations in the rate of rotation in the reversing layer at the sun's equator. The one is cyclical in about a month, with a range in the velocity of 0.15 km. per second. This represents a variation in the duration of one complete rotation of the sun amounting to nearly 2½ days. The other variation is secular, the mean velocity in 1915 having been found to be 0.04 km. per second lower than it was in 1913. DeLury, however, thinks that these variations are due rather to variations in terrestrial haze. Moreover, he is of the opinion that this blending of haze spectrum with the solar spectrum is responsible for the observed difference in amount of displacement of different lines, which Adams has interpreted as showing that the higher layers rotate more rapidly than the lower layers. Naturally a great deal of similar work must be done before these variations can be known with precision and their causes determined. Some such variations were suspected and suggested by Adams from a comparison of his observations of 1906-8 with those of 1911-13. (*Astrophys. Jour.*, xliii, 145; xliv, 177.)

From an elaborate mathematical discussion, Störmer is forced to the opinion that the magnetic field of sun-spots is due to galvanic instead of convection currents. (*A. Y. B.*, 1915, p. 586; *Astrophys. Jour.*, xliii, 347.)

Observations of the sun with the silver-disk pyrheliometer and nearly simultaneous measurements of atmospheric humidity made in 1912-14 at Arequipa, Peru, at the station of the Harvard College Observatory, have shown that observations of such relatively simple character at eight or ten favorable stations of high level in various parts of the world would determine the variations in the intensity of the sun's radiation almost or quite as certainly as complete barometric observations at two stations. A remarkably close connection is found between the measured radiation and the pressure of water vapor in the earth's atmosphere. Apparently the volcanic dust from the eruption of Katmai, Alaska (*A. Y. B.*, 1912, p. 612; 1913, pp. 616, 631), did not cross the equator, as no effect of it was shown in the Arequipa observations. The results confirm the variability of the intensity of the sun's radiation, as observed at Mount Wil-

son and elsewhere. (*Smithsonian Misc. Coll.*, lxv, No. 9.)

Comets.—The last comet of 1915 and the first comet of 1916 are similar in period of revolution about the sun and also in distance from the sun when nearest that body. They both apparently belong to the so-called "Jupiter family," a group of comets whose greatest distance from the sun approximates to the distance of Jupiter. It has long been supposed that Jupiter, by its attraction, has been responsible for the transformation of these wanderers into members of the solar system, revolving about the sun in elliptical orbits. Comet 1915e was discovered by Tayler at the Cape of Good Hope on Dec. 2, 1915, and passed its nearest point to the earth on Jan. 2, 1916, when it was 56,000,000 miles distant. On Jan. 28 it was closest to the sun (in perihelion) at a distance of 135,000,000 miles from the sun. The comet is now moving in an elliptical orbit, and though apparently it has never been seen before, should return to perihelion after 5.3 years. Comet 1916a, discovered by Neujmin on Feb. 25, is likewise moving in an elliptical orbit, in a period of about five years. It passed through perihelion on March 11, when it was 124,000,000 miles from the sun. The similarity of the orbit with that of comet 1889-VI points to the possible identity of the two comets.

The remarkable comet 1916b was discovered by Wolf of Heidelberg on April 27, as a very faint object moving very slowly, with the appearance of an asteroid. When discovered its distance from the sun was as great as the radius of Jupiter's orbit, while it was four times as far from the earth as is the sun, both distances being greater than those of any other comet at the time of discovery. The visibility of this comet at such great distances, both from the sun and the earth, makes it an object of great interest. The slowness of its motion makes the range of possible solutions very great, from an ellipse with a period of about 50 years to an orbit slightly hyperbolic. Until it has been observed for a considerable time we shall not know whether it will ever return to the solar system. According to the orbital calculations, the comet will not reach its nearest point to the sun until June, 1917, when it will probably be visible to the naked eye.

Encke's periodic comet was detected by Strömgren on Sept. 22, and in the order of discovery was designated 1916c, although it has been "discovered" many times since its first observed appearance in 1786. It is famous for its short period of less than three and one-half years and for the steady shortening of this period, and attendant decrease in the size of the orbit.

Comet 1916d was a very faint comet discovered by Metcalf Nov. 21 in the constellation of Aries. Further observations must be secured before anything is known concerning this comet.

On the evening of May 4, a luminous object resembling a comet was observed from Cordoba. The object was 8° or 10° long, was within about 33° of the south pole when discovered, and was moving northeastward at the rate of 10° per hour. With this rapid motion it disappeared in the horizon haze after an hour's observation, in spite of the diurnal motion of the heavens. Three observations of position, however, were obtained, from which an orbit about the sun was computed. Its rapid motion shows that the object was very close to the earth, and whether a comet or a meteor trail, it was evidently a remarkable phenomenon. Unfortunately, it was not seen again, either at Cordoba or elsewhere.

Distribution of Stars and Nebulous Matter.—Turner has continued his counts of stars of certain magnitudes in the zones of the Astrographic Chart, as the material becomes available. The more recent material bears out his earlier conclusion of the existence of "obscured" regions in the sky, evidenced by the relatively fewer faint stars visible therein than elsewhere. The region of "obscuration" is found to be a spiral, with median line crossing the celestial equator 247° east of the vernal equinox, which is bounded sharply in the northern hemisphere on the side of smaller right ascension (distance eastward from the vernal equinox) and sharply in the

southern hemisphere on the side of greater right ascension. The place where the sharp boundary shifts from one side to the other cannot at present be specified, as no results for the zones between 1° and 31° south of the equator have been published. (*Monthly Notices Roy. Astron. Soc.*)

In many regions of the sky there are small areas of various extent in which few or no stars are to be seen. These areas are often thought of as openings through which we look out into the blackness of space beyond. Sometimes they appear as dark rifts in a nebulous mass of luminous gas; sometimes no stars are to be seen on one side of a nebula, creating the impression that the nebula has moved and collected to itself all the stars as it advanced; in some cases an irregular patch devoid of stars appears distinctly blacker than the sky between the stars. Barnard is of the opinion that, at least in the last case, we are looking at a dense, dark nebula, located between us and the stars, which are supposed to be hidden behind it. This opinion does violence, of course, to the generally entertained opinion that all nebulae develop into stars, and it assumes further, as seems justified by photographic reproductions, that interstellar space is faintly luminous. It is supported by the analogy of the presence in space of dark stars, comparable in number with the luminous stars, which betray their presence by gravitational action and eclipses. (*Astrophys. Jour.*, xliii, 1.)

Bearing on this same question is the spectroscopic evidence of the presence in space of calcium clouds. The spectra of some stars, while showing, by the broadening or pairing of the hydrogen and helium and other lines that the stars are double, show the K line of calcium narrow and stationary. In some cases (VV Orionis as a recent example) the investigation lends support to the hypothesis of the presence of a calcium cloud, stationary in space, between us and the star, as the constant velocity obtained for the K line averages very nearly the same as the velocity of the solar system away from that region. In the case of σ Aquilae, on the other hand, the average velocity obtained for the relatively stationary K line is so near that of the whole system that the origin of the line seems to be in the system itself. In this system and in a few others there is evidence, from their oscillation in the period of the other lines, of K lines originating also in the component stars. (*Publ. Allegheny Observatory*, iii., Nos. 21, 22.)

Such clouds of nebulous matter are probably limited in their extent, however, as a considerable amount of evidence has been accumulated against a fairly uniform distribution of matter throughout interstellar space. Such matter, if present, would probably, by its absorption, cause distant stars to look redder than the nearer ones. The great Hercules cluster, whose distance is estimated by Shapley as a hundred thousand light-years (and which, if this estimate is near the truth, is by itself a universe of stars), is largely made up of bluish stars.

Nebulae.—Success in the spectrographic determination of the motion of nebulae through space and of motion within the nebulae themselves has come only in the past few years. The facts being learned are among the most startling which astronomical research has yielded in many years. The observation of more spiral nebulae has not materially changed the average motion in the line of sight of 400 km. per second, announced in 1914. Regarding the scattered stars visible to us as a galaxy or sub-universe comparable with each spiral nebula, attempts have been made, from the small amount of material available, to determine, from the apparent motions of the spiral nebulae, the direction and speed of the motion of our galaxy through space. Values for the velocity in the neighborhood of 600 km. have been derived, but the values are very uncertain, and of course the entire conception may be a false one. The positions of knots and condensations on the arms of one of the spirals have been measured on photographs taken at times separated by considerable intervals. This study makes apparent a distinct community of motion along the arms of the spiral at right angles to our line of sight. The rotational component of this motion corresponds to a complete rotation of the nebula in 85,000 years. Definite spectrographic evidence of ro-

tation has been observed at the Lick Observatory in 16 planetary nebulae, and suspected in five others. In the nebulae where condensation increases steadily toward the centre, simple rotation seems to be going on, the outer strata rotating more slowly than those nearer the center. Rotation seems to be combined with other forms of motion in nebulae which have a strongly condensed nucleus surrounded by a ring. There has been observed a bowing and widening of lines in the spectra of several nebulae, possibly indicating motion of some of the material toward the nucleus. An 80-hour exposure with the 60-in. Mt. Wilson reflector shows the radial velocity of one of the spirals to be 1,180 km. per second, while the rotation velocity at a distance of 2′ from the center is 330 km. per second. Photographing nebulae with ordinary plates and also with isochromatic plates and a color filter, Seares has learned the interesting fact that the nuclei of three spiral nebulae are rich in yellow light, while the arms as a whole, and to a still more marked degree, the knots of material along the arms, are relatively blue.

Photometry.—Confidence in the photometry of stars with the photo-electric cell will be increased by recent investigations which show that the non-rectilinear relationships sometimes found between the illumination by the star and the measured photo-electric current are due to an accumulation of charges on the walls of the cells, and that it is possible so to construct a cell that these accumulations are prevented. The photo-electric method of measuring the light of a star is very sensitive, and one in which the faulty judgment of the eye in estimating the equality of two light impressions is eliminated, but its use would be limited and complicated by any change with brightness of the proportionality between brightness and the resulting current. Several astronomers are working successfully with photo-electric cells. (*Astrophys. Jour.*, xliii, 9.)

Another promising method of attack on this problem of substituting physical for visual measures has been developed recently. It will be remembered that the practicability has already been shown of measuring stellar radiation with a thermopile placed at the focus of a large telescope (*A. Y. B.*, 1915, p. 588). The thermopile has now been applied with excellent success to the measurement of the opacity of photographic images. It has been shown that the instrument is sufficiently sensitive to determine light curves of variables, locate the maximum intensity in a diffuse spectral line, and determine the energy curve of a stellar spectrum. (*Astrophys. Jour.*, xliii, 253, 325.)

The Laws Observatory has been equipped for photographic photometry. Great care is shown in the control of observing and developing conditions, and a careful study has been made of the effects of known factors. The method of observation adopted is that known as the extrafocal, in which the magnitudes of stars are determined by measuring the density or degree of blackening of star images formed on a plate placed a short distance from the focus of the camera. A study of a number of eclipsing variables is being undertaken. (Laws Obs. Bull., 24.)

Variable Stars.—Increasing activity is being shown in the study of variations in the periods of variables of the Algol and Cepheid types. This is due partly to a demand for more accurate results, partly to the fact that some of these stars have been under observation long enough to justify such investigations, which, though in some cases based on observations covering hardly more than one-half the period of variation, can scarcely be improved upon for many years to come. The two components in a system of the Algol type (Algol was the star first found to show this type of light-variation) mutually eclipse each other at each revolution about their centre of gravity. The characteristic light variation is repeated in a practically identical manner at each revolution. Observations of the light received from the star can therefore be made over an interval of several years, and all combined into a mean light curve, study of which will enable the investigator to learn many interesting characteristics of the system, including the relative sizes of the two components, the relative sur-

face brightness, their ellipticity of figure, difference in brightness of opposite sides of the stars, and the eccentricity of the orbit in which they revolve. If the components, moving in elliptical orbits, are not spheres, a slow progressive change in the direction of the longest axis of the relative orbit is to be expected. Such a perturbation would cause the interval between corresponding eclipses to vary in a periodic manner, for a while coming later than the times predicted by a constant period, and again, after several years, later. Stars of the Cepheid type increase rapidly in brightness to a maximum and then fade out gradually, to repeat the performance after a certain nearly constant interval. The variation of the Cepheid type is probably not due to the eclipses of a binary system but possibly rather to periodic pulsations within the star. The effects upon the brightness of the star are, as might be expected, less simple and regular than is the case with Algol variables. The periods of Cepheid variables are found to vary slowly, and there is also a more or less periodic change in the rapidity and manner of the light variation. The spectral type or color of several stars of both types is different at minimum and maximum brightness. This shows that the components of an eclipsing system are often not of the same color and are at different stages of evolution, and that in the Cepheid variables constitutional changes accompany the light variations. The spectra of the latter change periodically along the normal stellar spectral series. (*Astron. Nachr.*, ccii, 137; *Astrophys. Jour.*, xliii, 217; xliv, 51; *Proc. Natl. Acad. of Sciences*, April, 1916; *Monthly Notices Roy. Astron. Soc.*)

Proper Motion.—The slow motion of the stars on the background of the sky-motion at right angles to our line of sight, the so-called proper motion, which can only be detected by comparison of measurements made several years apart, leads to many interesting inferences concerning the structure and history of our universe. A star of the 10th magnitude is found by Barnard to have the largest proper motion yet known, amounting to 10″.3 a year. The star is moving almost due north. The rapidity with which it moves among the other stars is largely due to its unusually small distance from the solar system. Preliminary calculations give it a probable parallax of considerably more than half a second. Since the star is both near and faint, its absolute brightness is very small—less than one three-thousandth that of the sun. This star is in fact the faintest known. (*Astron. Jour.*, xxix, 181.)

XXIII. GEOLOGY, METEOROLOGY, AND GEOGRAPHY

GEOLOGY

DYNAMICAL AND STRUCTURAL GEOLOGY

J. B. Woodworth

Pre-Cambrian and Cambrian.—Andrew C. Lawson (*Bull. Dept. Geol. Univ. Cal.*, x, 1-19, 1916) correlates the Pre-Cambrian rocks of the Great Lakes region on the hypothesis of two periods of granitic intrusion. In the author's scheme, Pre-Cambrian, following the usage of Van Hise, includes an older, Archean, and a younger, Algonkian, division. The Archean embraces an older Ontarian Period or Series, divided from below upward into the Coutchiching, the Keewatin, and the Grenville Epoch or Series, followed by the first or Laurentian epoch of great granitic intrusions. The Epilaurentian interval of erosion, marked by a major unconformity, separates the older Ontarian from the younger Archean or Huronian Period or System. The Huronian consists of the Bruce Epoch or Series, to which succeeds, generally in unconformable superposition, the Temiskamian Epoch or Series. This record is closed by the Algoman episode of granitic intrusions, followed by widespread erosion giving rise to the unconformity between the above named oldest rocks of the Archean and the overlying Algonkian. To this erosion interval the name Eparchean is applied. The formations immediately succeeding the unconformity are doubtfully referred by Lawson to the Palæozoic era, under the caption Algonkian Period or System, of which the Animikian Epoch or Series is the lower, and the Keweenawan Epoch or Series the upper member.

The Pre-Cambrian rocks of the Canton quadrangle in the Adirondacks are reported on by James C. Martin (N. Y. State Museum Bull. 185, 1916); the paper gives an accurate account of the folded and contorted structure of schistose rocks. W. J. Miller describes (*ibid.*, No. 182, 1916) the geology of the Lake Pleasant quadrangle, a region of Palæozoic strata locally downfaulted in areas of Pre-Cambrian. The relations between the Pre-Cambrian and Cambrian formations in the vicinity of Helena, Mont., are described by C. D. Walcott (*Smithson. Misc. Coll.*, lxiv, 1916, 259-301) in refutation of the arguments of Dr. August Rothpletz (*Die Fauna der Beltformation bei Helena in Montana*, Munich, 1915). L. F. Noble and J. F. Hunter (U. S. Geol. Surv., Prof. Paper 98-I) find that the Archean complex of the Granite Gorge in the Grand Cañon of Arizona includes under the name Vishnu schist two or more very different series of metamorphic rocks of igneous and sedimentary origin.

Folds and Faults.—R. A. Daly (*Bull. Geol. Soc. Amer.*, xxvii, 1916, 89-92) proposes the adoption of the term "homocline" to include "any block or mass of bedded rocks all dipping in the same direction." The term monocline he would restrict to its one-time usage as found in the writings of Dutton and Sir Archibald Geikie, in which sense it is the English equivalent of *flexure* as advocated by Heim and De Margerie. The article sets forth the different uses of the term monocline. Winthrop P. Haynes (*Jour. Geol.*, xxiv, 1916, 269-290) gives an account of the rocks involved in the Lambert overthrust near Three Forks, Montana. The mechanics of the Panama Canal slides are treated mathematically by G. F. Becker (U. S. Geol. Surv., Prof. Paper 98-N, pp. 253-261) in a paper of general application to the understanding of the formation and movement of landslides

on river banks and seacoasts. Charles Butts gives an account (*Jour. Wash. Acad. Sci.*, vi, 1916, 251) of a fault block near Henrietta in central Pennsylvania. In a description of the Acadian Triassic area (*Jour. Geol.*, xxiv, 1916, 1-26, 105-122, 254-268) Sidney Powers locates and maps the faults by which that district is beset. Increased attention is being given and should be paid to the greater fault lines of the country because of the origin of tectonic earthquakes through the renewed movement of rocks along these lines of fracture and displacement.

Palæozoic Banded Shales.—Several geologists have proposed to account for the alternating bands of thick and thin, fat and lean (or sandy) clays, in the recent glacial series by the waxing and waning of clay-depositing waters dependent upon the rotation of the seasons during an epoch of glaciation, one layer being referred to summer or the period of maximum melting of the ice and consequent increased deposition, the other to winter with its diminished outwash of detritus. R. W. Sayles finds that the banded shales and slates at Squantum, Mass., associated with the tillite or glacial boulder bed of that locality, are essentially like the modern glacial clays in structure and origin. He therefore concludes that during the Permian glacial epoch there were seasonal changes involving the recognition of a winter and summer (*Proc. Nat. Acad. Sci.*, ii, 1916, 167-170).

Mud Lumps.—The mud lumps of the Mississippi delta have long proved troublesome to engineers and have been little understood by geologists. E. W. Shaw (U. S. Geol. Surv., Prof. Paper 85-B, 1913) discusses their now known structure and probable origin. He ascribes the formation of the mud lumps to a bodily flowage of the delta towards its unsupported edge, resulting in a squeezing of the soft layers and the accumulation of the clays in places where the pressure is less. This explanation accords with many previous observations on dikes and irregular intrusions of clays in recent delta deposits in regions recently uplifted from the sea.

Stratigraphy.—The Palæozoic rocks of Arizona are summarised in a paper by F. L. Ransome (U. S. Geol. Surv., Prof. Paper 98-K, 1916, 133-166). The Ordovician is locally identified in the region, but Silurian strata have not been recognized. In the Gulf coastal plain, Matson and Berry have worked out and described the Pliocene as a single formation of chiefly non-marine origin known as the Citronelle, varying from 50 to 400 ft. in thickness. From eastern Texas to Alabama the formation occurs in high level terraces mainly composed of yellow and red sands and clay. The formation is represented by marine marls in peninsular Florida.

The "Upper Cretaceous Deposits of Maryland" is the title of the sixth volume of a series of reports on the geology of that state. The present work is by the Director, Dr. W. B. Clark. The formations described in ascending order are the Raritan, Magothy, Matawan, Monmouth and Rancocas.

Minor Studies.—C. W. Tomlinson (*Jour. Geol.*, xxiv, 1916, 253) reviews the red-bed question, concluding, as Barrell has stated, that "red color in sediments is not itself an indication of aridity." Donald C. Barton presents a much needed discussion of the definition of the term "arkose" and the interpretation of the deposits of this rock (*ibid.*, 417-449). The types of prismatic structure in igneous rocks are ascribed by R. B. Sosman (*ibid.*, 215-234) to thermal contraction of the rock after crystallization; contraction and separation while the magma is only in part crystalline; and, lastly, internal expansion as shown by "weather cracks" in diabase boulders. R. M. Field has a paper (*Ottawa Naturalist*, xxx, 1916) on the origin and classification of intraformational conglomerates and breccias.

Geological Surveys.—A geological reconnaissance of Porto Rico by C. P. Berkey (*Ann. N. Y. Acad. Sci.*, xxvi, 1915, 1-70) has resulted in the publication of a black-line geological map of the island showing the approximate boundaries of the Tertiary formation. Two structure sections represent the relations of the highly inclined sediments and the igneous

intrusions of the interior. A more detailed report is promised.

The summary report of the Geological Survey of Canada for 1915 (Ottawa, 1916) includes in R. M. Anderson's account of the Canadian Arctic Expedition (p. 220) the geological report of J. J. O'Neill (pp. 236-241). Numerous condensed accounts of geological surveys carried on by the staff accompany the report. A. E. Foerste (Memoir 83) describes the Upper Ordovician formation in Ontario and Quebec. J. D. Mackenzie (Memoir 88) gives an account of the geology of Krakaur Island, B. C.

Bibliography.—Bulletin 645 of the U. S. Geological Survey includes a list of papers on the geology of North America published in 1915. J. C. Branner's *Geologia Elementar* (2d ed., Rio de Janeiro, Brazil), a textbook of geology prepared especially for Brazilian students, contains the best compendium of Brazilian geology and also several small scaled geological maps of the country. H. F. Cleland has published *Geology: Physical and Historical* (New York Am. Book Co., 1916), and Wm. J. Miller, *An Introduction to Historical Geology* (New York, D. Van Nostrand Co., 1916). *Field Geology* by Fred H. Lahee (New York, McGraw-Hill Book Co., 1916) is a useful compendium on the lines of Sir A. Geikie's book of 1879.

ECONOMIC GEOLOGY

ADOLPH KNOPF

Secondary Sulphide Enrichment.—Progress in the theory of ore deposits during the year has centered mainly on the problems of secondary sulphide enrichment. These problems have recently attracted the attention of able chemists, and in consequence much fruitful experimental work is now being done on them. Since work of this kind should be carried on at ordinary temperatures in order to reproduce the conditions prevailing in nature, the difficulties, already great, are much increased, because of the inertness of the mineral sulphides. Young and Moore, working in the laboratories of Stanford University, believe, however, that eventually all the difficulties will be overcome. They have developed a procedure that appears destined to throw much light on mineral transformations; they call this the "method of artificial replacement." Minerals after being sectioned and polished may be studied and mapped, then treated with various reagents, and the change noted after a repolishing. Replacements resembling those seen in natural minerals, such as the formation of chalcopyrite at the expense of melaconite veinlets traversing chalcocite, were effected in comparatively short time in the laboratory.

Zies, Allen and Merwin, working in the Geophysical Laboratory of the Carnegie Institute, have investigated the action of copper sulphate solutions on the sulphides commonly occurring in copper deposits. These reactions are peculiarly important, inasmuch as it is due to them that the great masses of ore-bearing porphyry, whose output now dominates the copper industry, became sufficiently enriched in copper to be commercially valuable. A number of important equations are quantitatively established. The main geologic result that may be drawn from the immense amount of detailed work done is that chalcocite predominates universally in supergene enriched ore because cuprous sulphide is more insoluble than cupric sulphide and because covellite is oxidized to chalcocite by cupric sulphate.

"The Enrichment of Ore Deposits" by W. H. Emmons (U. S. Geol. Surv. Bull. 625) is an amplification of an earlier bulletin on the enrichment of sulphide ores published in 1913. In the new report all the enrichments effected during oxidation are considered and the reactions of 15 chemical elements not discussed in the earlier report have been added. It is interesting to note that, as pointed out by Emmons, Whitney, writing in 1854, first applied the theory of secondary sulphide enrichment to account for the rich mass of bluish-black sulphide below the gossan at Ducktown, Tenn. Although the fundamental principles of the theory were clearly grasped by Whitney so early, it was not until 1900, after their rediscovery and announcement by S. F. Em-

mons and others, that they gained general recognition.

Microscopic Study of Minerals.—A valuable by-product of recent studies in secondary enrichment is the "Microscopical Determination of the Opaque Minerals," by Joseph Murdoch. The opaque constituents of ores have always presented great obstacles to their successful study, but the difficulties have now been partly conquered by the methods developed by Murdoch. The physical and chemical properties of 186 opaque minerals, as determinable in polished section under the reflecting microscope, were carefully studied, and the results are presented in a set of identification tables. These tables must prove a powerful auxiliary in investigations of ore deposits.

Much has been done in recent years in the study of ores under the metallographic microscope and many valuable papers, generally descriptive, have appeared. Owing to the newness of these studies the results suffer in two respects: first, the theoretical interpretations drawn are often insecure because fundamental criteria have not yet been established; and, second, the results are commonly not securely coördinated with the geologic data, indeed some of the work leaves the impression that the investigator hoped to accomplish with increased microscopic magnification what had better been attained by more thorough field investigation. In a noteworthy paper W. L. Whitehead (*Econ. Geol.*, xi) formulates and evaluates some criteria by which certain sulphide intergrowths may be recognized as having resulted from metasomatic replacement. C. F. Tolman, in a paper illustrated by a large number of remarkably fine plates (*Bull. Am. Inst. Min. Eng.*, No. 110), presents the results of an important study of chalcocite.

Gold Deposits of the Witwatersrand.—Of deep interest, not only in regard to the specific problem in hand but also in regard to the wider problem of the methods of attack on the problems of ore genesis, is E. T. Mellor's study of the conglomerates of the Witwatersrand (*Bull. Inst. Min. Met.*, No. 137). The results obtained during five years detailed mapping of the Witwatersrand area, which exceeds 1,000 sq. miles, are summarized, and the conclusion is reached, based on the broad geologic evidence rather than on the petrographic or microscopical, that the Rand gold deposits are an ancient delta, closely analogous to the auriferous coastal-plain gravels of Nome, Alaska.

Iron Ores.—In "Wabana Iron Ore of Newfoundland" (Canada Geol. Surv., Mem. 78), by A. O. Hayes, the geology and origin of these great iron-ore deposits are for the first time described in detail. The ore consists of oölitic hematite and chamosite, the oölites being commonly pierced by boring algae. The algal tubules, ranging from one-fifth to four microns in diameter, are as a rule astonishingly well preserved, as may be seen in the excellent microphotographs accompanying the report. Unquestionably the iron-bearing minerals of the oölites were precipitated while the algae flourished on the sea bottom. The report is a noteworthy contribution to the geology of the marine sedimentary iron ores.

Petroleum Resources.—The petroleum supply of the United States is estimated by Ralph Arnold (*Econ. Geol.*, x) to be 5,763 million barrels. This reserve would last, at the present rate of production, 22 years, but as this rate will surely decrease, the supply will probably last from 50 to 75 years.

MINERALOGY AND PETROGRAPHY

HERBERT P. WHITLOCK

Crystallography.—By far the most important work which has been accomplished in recent years along the line of crystal structure and molecular grouping is that of W. H. and W. L. Bragg which is now collectively published under the title *X-Rays and Crystal Structure* (London, G. Bell & Sons, 1915). What for years has amounted to a theoretical speculation as to the relative groupings of the particles of matter finding expression in the outward form and physical phenomena exhibited by crystals, has now received confirmation of a most convincing kind. In the words of the

authors: "Instead of guessing the internal arrangement of the atoms from the outward form assumed by the crystal, we find ourselves able to measure the actual distances from atom to atom and to draw a diagram as if we were making a plan of a building." These results are arrived at by obtaining diffraction spectra from pencils of X-rays which are caused to interfere by the net-work of regularly spaced atoms of the crystal, much as a pencil of ordinary light is broken up by a diffraction grating. This idea was first conceived by Dr. Laue of the University of Zurich in 1913 and was at once recognized as the entering wedge in what has come to be a new development of the science of crystallography. The results which have been obtained by the X-ray spectrometer devised by Dr. Bragg and his son enabled them to discover both the space lattice on which the atoms are arranged and the way in which they are grouped round each point of the space lattice. This amounts to a long stride in the direction of the ultimate goal of crystal morphology and brings us close to the prediction of the crystalline form of a substance from its chemical constitution.

New Minerals and Reviews.—With the publication of Dr. W. T. Schaller's "Third Series of Mineralogic Notes" (U. S. Geol. Surv. Bull. 610, 1916), the science of mineralogy becomes enriched to the extent of four new species: koechlinite, a new bismuth molybdate; inyoite and meyerhofferite, two new calcium borates; and lucinite, a new hydrated aluminium phosphate, dimorphous with variscite.

The "Third Appendix" to Dana's *System of Mineralogy* by William E. Ford (New York, John Wiley & Sons, 1916), covering as it does the advance in mineralogy between the years 1909 and 1915, furnishes a valuable record of a period crowded with scientific interest. That this is the fact is evidenced by the list of new mineral names, which numbers 183 for the six years, as against 202 for the ten-years period from 1899 to 1909. The shortening of the interval of publication, however, has not prevented the suppression, for lack of space, of some of the crystallographic data which greatly enhanced the value of former appendices, a tendency which has also resulted in the elimination from the bibliography of such works of primary importance as Schaller's "Mercury Minerals from Terlingua, Texas," and Zambonini's *Mineralogia Vesuviana*.

Meteorites.—The need for a comprehensive handbook on the subject of meteorites, which has long been felt and frequently expressed, is now admirably supplied in Oliver C. Farrington's *Meteorites, their Structure, Composition and Terrestrial Relations* (Chicago, published by the author, 1915). In this book of 233 pages the author has achieved the difficult task of producing at once a work of undoubted scientific value and considerable popular interest. Particularly is this the case with the chapters on "Phenomena of Fall," "Structure of Meteorites," and "Origin of Meteorites." In the chapter on composition of meteorites the author has collected observations of first importance to the mineralogist and both in the annotated references under each species and in the copious footnotes has furnished a bibliography of value on meteoric minerals.

In the "Catalogue of the Meteorites of North America" (*Mem. Nat. Acad. of Sciences*, xiii, 1915) Dr. Farrington has produced the standard work of reference on American meteorites, which is much more comprehensive than its somewhat modest title would suggest. The following data are tabulated under the heading of each fall: (1) county and state; (2) latitude and longitude; (3) descriptive classification; (4) date of fall or discovery and description; (5) total weight where known. To these facts, which constitute the bulk of information ordinarily furnished by catalogues, Dr. Farrington adds detailed descriptions, involving abstracts from original published articles, chemical analyses, information as to the present disposition of the bulk of the fall, and individual bibliographies amounting to an average of two quarto pages for each of the 247 occurrences included in the work, which is complete to Jan. 1, 1909. The catalogue is illustrated with 36

outline maps showing the geographical distribution of the falls.

Gems and Precious Stones.—George F. Kunz has published a companion volume to his *Curious Lore of Precious Stones* under the title of *The Magic of Jewels and Charms* (Philadelphia, J. B. Lippincott Co., 1915). Like its predecessor this work abounds in interesting references to rare literature and esoteric information, some of which distinctly comes under the head of gem symbolism. Particularly is this the case with the chapters on the "Religious Use of Various Stones" and on "Amulets." The student of gem myth, however, will be somewhat disappointed by his failure to find a discussion of the seal of King Solomon, or the gem material from which the Sangraal was fashioned or the much discussed "chalchihuitl" question.

Not only the jeweler but the diamond buying public will welcome the book entitled *Diamonds: a Study of the Factors that Govern their Value*, by Frank B. Wade (New York, G. P. Putnam's Sons, 1916). The author has given in a most readable form a wealth of information, evidently the result of intimate knowledge, regarding the valuation, cutting and mounting of diamonds. It is interesting to note that almost without exception throughout the work, Mr. Wade has refrained from the unwisdom of quoting definite values per carat, a feature which gives a lasting usefulness to his little book which it could not possibly have had assuming he had attempted to deal in anything but relative values.

On the determinative side of gems and gem minerals, a very useful set of "Tables for the Determination of Gems and Precious or Ornamental Stones without Injury to the Specimen" (*School of Mines Quar.*, xxxvi, 1915) have been prepared by Prof. Alfred J. Moses of Columbia University. In these the primary division is a color classification, an arrangement which admits of gem varieties being separated under their trade names, and also of the enumeration of such stones as calamine and chrysocolla in both the blue and green lists. The weak point of the scheme from the jeweler's point of view is the emphasis laid upon such characters as index of refraction and optical character, criteria which necessitate the use of special optical instruments not usually included in a jeweler's equipment.

EARTHQUAKES AND VOLCANOES

HARRY FIELDING REID

Earthquakes.—The following paragraphs list the more important earthquakes which have taken place during the year. A fairly strong shock, having its origin near Skyland, N. C., occurred about 5.40 p. m. on Feb. 21; a number of houses were injured at Skyland, and at Asheville, near by, one chimney was torn down. This shock was felt over a very large area, probably 225,000 sq. miles, in the states of North Carolina, South Carolina, Georgia, Alabama, Tennessee, Kentucky and Virginia, and probably, though not reported, in West Virginia and Ohio. The most distant point from the origin reporting the shock was Wilmington, N. C., at a distance of 275 miles. A light shock had been reported from about the same origin on Oct. 29, 1915, and a fairly sharp shock about 100 miles further west on Aug. 26, 1916. On Oct. 18, a strong shock was felt at Birmingham, Ala., where many chimneys were overthrown; it was felt over a very wide area, probably 400,000 sq. miles, and at points as far as 350 miles from origin. A light after-shock was felt at Birmingham on Oct. 22. A fairly sharp shock occurred at 12.40 p. m. on Dec. 7, 1915, in the sunken country of southeastern Missouri, which was felt in Missouri, Arkansas, Mississippi, Tennessee, Kentucky and Illinois, over an area of about 60,000 sq. miles. Later minor shocks in that neighborhood were felt on May 21 and Aug. 24, and in southern Illinois, near by, on Feb. 17 and May 21.

Quite a number of shocks have been felt in the northern part of Nevada, culminating in a pretty strong shock at 9.02 p. m. on Feb. 2, which was felt over an area of about 100,000 sq. miles. Earlier shocks were recorded on Oct. 15, 19, 22, Nov. 17, 22, Dec. 18, 1915, and Jan. 18, and

later shocks on Feb. 13, April 17 and Aug. 3.

A series of shocks are reported from central and western Idaho on April 12, 13, 14, 29, May 12, 13 (2), and 25. The strongest was on May 13 at 7.30 p. m., and was central near the border of Idaho, about 80 miles northwest of Boise; it was felt over an area of about 50,000 sq. miles, including parts of the neighboring state of Oregon.

On Nov. 21, 1915, a strong shock occurred near Calexico in the Imperial Valley, on the southern frontier of California; reports are somewhat discordant, but some damage was done to houses in Calexico. At Yuma clocks were stopped; the shock was felt as far as Los Angeles, and probably over an area of about 80,000 sq. miles. Later shocks occurred on Jan. 15, March 11, May 24, June 7, and several shocks during the day and evening of Sept. 29. On Oct. 22 a pretty strong shock, with its origin not far from Tehachapi, at the southern end of San Juaquin Valley, Cal., seems to have been felt over an area of about 30,000 sq. miles.

Light shocks are reported from New York State near Lake George on Jan. 5, near Amsterdam on Feb. 2, and a little north of New York City on June 8; from Charleston or Summerville, S. C., Dec. 12, 1915, June 25 and July 14; from Worthington, Ind., Jan. 7; from Mayfield, Ky., Oct. 26, 1915; from Rongis, Wyo., Aug. 11; from Kadoka and Pine Ridge, S. D., Oct. 23, 1915, and Feb. 23, respectively; from Elberta and Santaquin, Utah, Feb. 4; from Socorro, N. M., July 1; from Nogales, southeastern Arizona, March 29; from central Washington, Dec. 10, 1915, Jan. 1 and March 2; from La Center, Nov. 18, 1915; from Marietta on Feb. 22, and from near Tacoma April 23; from Newport, Ore., Jan. 4. Many light shocks were reported in California: near Eureka, Dec. 31, 1915, July 4 and Aug. 23; in Mendocino County, Aug. 1; in the general neighborhood of San Francisco Bay, Oct. 7, 8, 22, 1915, and Jan. 15; in the region a little south of the Bay, Dec. 26, 1915, Feb. 4, May 2, June 26, 27, July 1 and 6, and several shocks Aug. 6-8; near Los Alamos, Feb. 27 and March 1; in eastern California, Feb. 19, April 12 and Aug. 13; in the far southern part of the state, Oct. 23, Nov. 25, Dec. 1 and 14, 1915, and Jan. 1 and 10, Feb. 25, May 2, July 16, 27, Aug. 20 and 21.

A strong shock was felt at 8.10 p. m. on Oct. 15, 1915, throughout the Kenai Peninsula in Alaska. A shock occurred under the Atlantic Ocean about 125 miles north of Porto Rico on Oct. 11, 1915, which was felt throughout the western part of that island; and on April 23, late at night, a strong shock did some damage in the eastern part of San Domingo, and was felt over the greater part of Porto Rico. Two moderate shocks were felt in the center of Porto Rico on May 13 and 14.

Quite a number of shocks were felt, but did not originate, in the Panama Canal Zone. A shock of Feb. 8 had its origin in the Los Santos Province of Panama; that of March 29 originated nearer the southern end of the Zone, but the exact place is not known. A very strong shock occurred near Bocas del Toro in the extreme northwestern part of Panama at 9.03 p. m. on April 25. Many houses were thrown from their supports and the railway tracks near Almirante were badly bent in several places. A small tidal wave carried canoes 200 m. inland at Bocas. This shock was strongly felt in the Canal Zone and caused some clocks to stop, although its origin was 160 miles distant. An earlier shock occurred at 3.02 a. m. the day before at Almirante; and there were several aftershocks, the strongest apparently being on May 10. The seismographs in the Canal Zone gave excellent records of these shocks.

About 20 shocks were reported from Guatemala City between Dec. 20 and 22, 1915, and a very severe shock from near Gracias, Honduras, on Dec. 26, 1915; all houses there were reported to have been destroyed. A very severe shock was felt in southwestern Nicaragua and in Costa Rico on Feb. 27. It seems to have been very strong at San Jose and San Juan del Sur. Further shocks were felt in the same places on May 1 and Sept. 23. Brazil has been pretty

free from earthquake shocks, but a shock was felt at San Amaro and Bahia on Nov. 6, 1915.

Volcanoes.—Lassen Peak has not attracted much attention during the year; eruptions were reported on Feb. 21, July 12, Oct. 5 and Dec. 25. The great lava lake in Kilauea, Hawaii, has been showing some interesting phenomena; during the spring the level of the lake rose slowly, reaching its highest point early in June; a very rapid drop then took place, the level falling 400 ft. in one day, June 5; since then the lake has been slowly rising with many fluctuations. Mauna Loa, near by, had an eruptive outburst of gas, followed by discharge of lava, between May 19 and 28, that is, about the time of the greatest elevation of the lava lake in Kilauea. The volcano of Izalco, in San Salvador, was in full eruption in October, 1915, and Tunguragua, in Ecuador, was in eruption early in March, 1916.

METEOROLOGY AND CLIMATOLOGY

ROBERT DEC. WARD

The Weather Bureau.—The latest Report of the Chief of the Weather Bureau for the year ending June 30, 1915, emphasizes several lines of activity which have added to the importance of the work of that organization. Three intensive surveys of the snowfall at high altitudes have been made, two in Utah and one in Wyoming. A fourth study was made of the rainfall over the Salt River watershed in Arizona. All this has reference to the supply of water available for irrigation. Kites were flown from the U. S. Coast Guard cutter *Seneca* during her spring and summer cruises into the North-Atlantic ice fields. The Bureau is now obtaining continuous records of the amount of solar and sky radiation received on a horizontal surface at Washington, D. C., Madison, Wis., and Lincoln, Neb. A "fire-weather warning service" has been established (April 10, 1916). District forecasters are now authorized to issue these warnings when conditions are favorable for forest fires in their respective districts. Such warnings were first authorized on the Pacific coast in the summer of 1913, and have proved of great value there. This subject is discussed in the *Monthly Weather Review* (xliv, 1916, 133-139). (See also XVII, *Agriculture.*)

Pan-American Scientific Congress.—A large number of important papers on meteorological subjects were read at the second Pan-American Scientific Congress, held in Washington, Dec. 27, 1915-Jan. 9, 1916. The attendance at the meetings of the subsection on meteorology and seismology was large and representative. Abstracts of some of the papers have been published (in the *Monthly Weather Review*, xliii, 1915).

Weather Forecasting.—The most comprehensive and important discussion of weather forecasting in the United States hitherto published has been prepared by Profs. A. J. Henry, E. H. Bowie, H. J. Cox and H. C. Frankenfield, all of the Weather Bureau. This report deals with the whole subject from many points of view, and is illustrated with a large number of typical weather maps. The monograph does not, of course, solve the difficulties of the problem of forecasting, but it does give, in very complete form, the combined experience of the forecasters of the Bureau. H. H. Clayton, of the Argentina Meteorological Service, has been successful in forecasting rain by means of a new method. The pressure distribution for the succeeding day is predicted; the resulting wind directions are inferred. The regions of converging winds are likely to be rainy, while those of diverging winds are likely to be fair (*Mo. Weather Rev.*, xliv, 1916).

Free Air.—A brief summary of recent progress in aerography is given by Prof. A. G. McAdie (*Geogr. Rev.*, i, 1916). The making of aerographic surveys is already under way, and the author believes that the day may not be far distant when charts of air structure will be available, for consecutive tri-hourly periods, for the use of aviators and aerial engineers.

Rainfall.—What Prof. Mark Jefferson considers to be "the essential facts of rainfall" for the United

States are presented by him in the form of simplified rainfall maps, from which details are omitted, and only the larger facts of distribution are indicated (*ibid.*). A good many misstatements have become current regarding the differences between tropical and extra-tropical rainfalls. Using the data for Porto Rico and for Maryland, Prof. Oliver L. Fassig has made a comparison of the duration, frequency and intensity of tropical rains and of those of middle latitudes, with some interesting results (*Mo. Weather Rev.*, xliv, 1916). A similarity in the rainfalls of North and of South America seems to H. H. Clayton so striking that he believes there is a common cause of the fluctuations. This may well be found in changes of solar heat (*ibid.*). A good rainfall map for New England has been lacking for some years. Such a map has now been prepared by X. H. Goodnough (*Jour. New Eng. Waterworks Assoc.*, xxix, 1915).

Storms.—The West Indian hurricane of August, 1915, which was especially severe at Galveston, Tex., and at other points in that state, has been fully described by Prof. H. C. Frankenfield (*Mo. Weather Rev.*, xliii, 1915). The high tide at Galveston was about as in the hurricane of 1900, but far less damage resulted owing to the protection afforded by the sea wall. The hurricane of late September, 1915, passed over New Orleans and established a new low-pressure record for the United States, 28.11 inches (sea level). For half a minute the wind blew at the rate of 130 miles an hour. Henryk Arctowski has investigated changes in storm frequency in the United States, and finds a correlation between these changes and the temperature ("pleionian") variations which he has for some time been studying (*ibid.*).

Thunderstorms.—What are likely, for some time to come, to be the standard charts of thunderstorm distribution for the United States have been prepared by W. H. Alexander (*ibid.*). The total numbers of thunderstorms for each month and for the year during the ten-years period 1904-1913 are charted. These data have been reduced to percentages by Herbert Lyman (*ibid.*).

Frost.—In a general summary of the methods of protection from damage by frost (*Geogr. Rev.*, i, 1916), W. G. Reed concludes that the best practice is fairly clean-burning, small fires, one to each one or two trees. The meteorology of frost formation is considered by Prof. Alexander McAdie (*Ann. Harv. Coll. Obs.*, lxxiii, 1915).

Agricultural Meteorology.—The application of the average interval curve to meteorological phenomena is suggested by W. J. Spillman, H. R. Tolley and W. G. Reed, of the Office of Farm Management, in connection with studies of the average frequency with which temperatures of any assigned limit will occur (*Mo. Weather Rev.*, xliv, 1916). Along somewhat similar lines Reed and Tolley discuss weather as a business risk in farming, the special risk concerned being the occurrence of frost earlier or later than the "average" date. Two maps show the standard deviation of the dates of first and last killing frost for the whole United States (*Geogr. Rev.*, i, 1916; *Mo. Weather Rev.*, xliv, 1916). (See also XVII, *Agriculture.*)

Blue Hill Observatory.—The very valuable series of standard, homogeneous meteorological records obtained at Blue Hill Observatory during the 30 years 1886-1915 has been summarized (*Ann. Harv. Coll. Obs.*, lxxiii, Pt. 3, 1916). This is a unique series in American meteorology. In this connection Professor McAdie has given a brief but complete summary of the essential facts concerning the winds of Boston and vicinity.

Climate and Changes of Climate.—The large control of climate over civilization is a subject to which a good many writers, for decades past, have referred. Ellsworth Huntington has recently devoted himself to this particular aspect of climatic control, and in his latest volume, *Civilization and Climate* (1915), has made a statistical and a general study of it. Charts showing the distribution of climatic energy and the distribution of civilization are shown to be in remarkably close agreement. The relation between oscillations of climate and economic cycles is considered by the same writer (*Geogr. Rev.*, i, 1916), with special reference to recent work of H. L. Moore in the United States and of

O. Petterson in Europe. It is obvious that such climatic oscillations are important in present human history, and their causes need careful study. The same author has also treated climatic variations as a neglected factor in race development (*Jour. Race Devel.*, vi, 195). Henryk Arctowski believes that the Krakatoa dust veil very greatly affected temperatures on the earth's surface, but that the eruptions of 1902 and the Katmai eruption of 1912 (*A. Y. B.*, 1912, p. 612) had very slight effect, if any, upon the mean annual temperature (*Ann. N. Y. Acad. Sci.*, xxvi, 195).

TERRESTRIAL MAGNETISM

Daniel L. Hazard

Observations on Land.—The magnetic survey of the United States was continued during 1916 by the occupation of about 220 stations, including 36 repeat stations and a number of auxiliary stations in locally disturbed areas. The work of this, the tenth, year of the magnetic survey of Canada brought the total number of stations up to about 500. Besides, numerous declination results were obtained by the surveyors engaged in the subdivision of the public lands. In addition to the usual comparisons at Ottawa and the Agincourt observatory near Toronto, comparisons were made at Washington, D. C., with the standard instruments of the Carnegie Institution of Washington, so that the results may be reduced to the international magnetic standards of that department. Magnetic observations were made in the following localities by observers of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington: northern China, Mongolia and Manchuria; British New Guinea and outlying islands of Australasia; interior of New Zealand and Australia; French and Belgian Congo; Tahiti; northwestern part of South America. Plans were completed for the erection of a magnetic observatory in southwestern Australia, and a preliminary investigation was made to find a suitable site for a similar observatory in Peru.

Observations at Sea.—The *Carnegie* left Lyttelton, New Zealand, on Dec. 6, 1915, and made daily observations during her circumnavigation of the sub-Antarctic regions in the vicinity of latitude 60°, returning to the same port on April 1, 1916. From there she sailed to Samoa, Guam, and San Francisco, having covered about 29,000 miles in the year.

Publications.—The U. S. Coast and Geodetic Survey has published the results of field observations made during 1915, and has ready for publication "Magnetic Tables and Magnetic Charts for 1915," containing the collected results of observations in the United States and adjacent territory to the end of 1915, and iso-magnetic maps for Jan. 1, 1915. The Department of Terrestrial Magnetism of the Carnegie Institution of Washington has in press Volume III of Publication No. 175, giving the final results of the ocean magnetic work from 1905 to 1914 and preliminary results for the present cruise of the *Carnegie*, about 3,200 stations in all, together with reports on various special investigations. The Argentina Meteorological Office has published the results of field magnetic observations 1912-1914, the results of magnetic observations made on Laurie Island, South Orkneys, 1905-1912, and a history of the Argentina Meteorological Service, including a summary of the magnetic-observatory results between 1905 and 1914. The Survey Department of Egypt has published (Paper No. 33) the results of the magnetic survey of Egypt and the Sudan, by H. E. Hurst.

Among the notable articles in periodicals during the year may be mentioned: J. P. Ault, "Magnetic Declinations and Chart Corrections Obtained by the *Carnegie* from December, 1915, to June, 1916" (*Terres. Mag.*, Sept., 1916); L. A. Bauer, "On Possible Planetary Magnetic Effects" (*Phys. Rev.*, April, 1916); L. A. Bauer, "The Work Done by the United States Coast and Geodetic Survey in the Field of Terrestrial Magnetism" (in centennial celebration publication of the Survey); L. A. Bauer and H. W. Fisk, "On the Results of Some Magnetic Observations During the Solar

Eclipse of Aug. 21, 1914" (*Terres. Mag.*, June, 1916); Charles Chree, "Discussion of Kew Magnetic Data, Especially the Diurnal Inequalities of H and Z from Ordinary Days of the Years 1890-1900" (*Philos. Trans. Roy. Soc. London*, Series A, ccxvi); Charles Chree, "Lord Kelvin and Terrestrial Magnetism" (*Nature*, Aug. 17, 1916); A. L. Cortie, "The Efficiency of Sun Spots in Relation to Terrestrial Magnetic Disturbances and to the Mean Daily Range of Declination" (*Monthly Notices Roy. Astron. Soc.*, Nov., 1915, and May, 1916); Otto Klotz, "Magnetic Results (Canada) 1915" (*Jour. Roy. Astron. Soc. Canada*, x, No. 6); E. W. Maunder, "Magnetic Disturbances (1904-1913) as recorded at the Royal Observatory, Greenwich, and Their Association with Solar Rotation" (*Monthly Notices Roy. Astron. Soc.*, Nov., 1915); H. Morize, "Results of Geographic and Magnetic Survey of the Southern Part of Brazil, 1913-1915" (*Terres. Mag.*, Sept., 1916); F. E. Nipher, "Disturbances Impressed upon the Earth's Magnetic Field" (*Trans. Acad. Sci. of St. Louis, Mo.*, xxiii, No. 4); Carl Störmer, "Preliminary Report on the Results of the Aurora Borealis Expedition to Bossekop in the Spring of 1913" (*Terres. Mag.*, Dec., 1915).

GEOGRAPHY

PHYSICAL GEOGRAPHY OF LAND AREAS

Wallace W. Atwood

Physiographic Provinces.—The most significant contribution to physical geography during the year 1916 was the preparation of a map accompanied by an explanatory text showing the physiographic divisions of the United States (*Ann. Assoc. Am. Georgraphers*, 1916). This was the work of a committee consisting of N. M. Fenneman (chairman), M. R. Campbell, Francois Matthes, Eliot Blackwelder, and W. D. Johnson. The work has been in progress for several years. Eight major divisions of the continent have been outlined, and these divisions have been further divided in the United States into 24 provinces. Eight of these provinces extend into Canada and five into Mexico. Still smaller divisions have been made called sections, of which there are 84, counting undivided provinces, within the United States. Divisions are made on the basis of physiography, not geology, climatology, or merely relief. The dominant features of each unit may be designated in terms of initial form, structure, and stage in erosion cycle. In the main, the divisions thus made are also distinguished from their neighbors by obvious features of relief, but in a few cases physiographic treatment requires the recognition of distinctions which are not very obvious to the casual observer. The scheme was not devised for the primary benefit of teaching, yet each division must necessarily be a convenient unit of treatment, assuming, of course, that the scientific treatment of land forms is based on their physiographic development.

Frederick L. Ransome has presented a broad outline of the topographic features of Arizona (U. S. Geol. Surv. Prof. Paper 98-K). At the northeast is a plateau region of about 45,000 sq. miles, in which the underlying formations are essentially horizontal. This is terminated at the west by the Grand Wash Cliffs which rise at places as much as 3,000 ft. above the plains to the west. The central topographic division is mountainous, and extends diagonally from the northwest to the southeast through the state. There the structure is complex, the formations being tilted and at places faulted. The width of this zone is from 70 to 150 miles, but its southwest boundary is not indicated by a sharp break in topography. Few of the individual ranges exceed 50 miles in length or 8,000 ft. in altitude. The third topographic division is at the southwest, and is characterized by short mountain ranges with a prevalent northwesterly trend. These ranges are separated by broad desert plains overlain by fluviatile or lacustrine deposits.

Warren M. Thayer has presented in the *Journal of Geology* an excellent description of the seven physiographic provinces of Mexico. At the eastern coast is the Gulf coastal plain.

Bordering that plain in the northern portion is the Anahuac desert plateau. This extends beyond the north boundary line of Mexico into the states of Texas, New Mexico and Arizona. The high mountain area west of the desert plateau is called the Sierra Madre Occidental, and still farther west in the northern portion is the Sonoran desert, which includes the region bordering the Gulf of California. To the south of the great desert plateau is the volcanic province, and still farther south, with a distinct change in the trend of the mountain structure, the Sierra del Sur. Adjoining that on the east is a small province called Tehuantepecan. The coastal plain is closely related in its physiographic history to the Atlantic and Gulf plain in the United States. The great plateau district is described as an uplifted and dissected peneplain. In the volcanic province the same peneplain is deeply buried under volcanic material.

The Minneapolis-St. Paul District.—In the U. S. Geological Survey folio (No. 201) of the Minneapolis-St. Paul district a distinct contribution has been made to our knowledge of the physical geography of that interesting region. In addition to a complete mapping of the glacial formations of the region Sardson has included text figures showing the extent of ice during the several glacial stages, the retreat of the falls of St. Anthony, and a section showing the relationship of the topography of the drift to the topography of the underlying rock surfaces.

Topographic Features of Central New Mexico.—The mountains, foothills, plains, and the details of the surface topography within that desert region are described in a brief but adequate way by Sidney Paige in the Silver City folio of the U. S. Geological Survey, and in connection with the geologic history in the district the evolution of the surface forms is given in some detail.

Reclaimed Lands in Gascony.—Reclamation on a large scale in Gascony is described by J. Blayae in *Annales de Geographie* (*"Contribution à l'Etudie du Sol des Landes de Gascogne,"* xxv, 23-46). What was once waste land between the sea and the valleys of the Garonne and Adour, comprising 8,300 sq. km., and supporting only broom and heather and many unhealthy swamps, has been converted in the last 60 years into fair farming land and excellent forest country. At one time many streams between the Garonne and the Adour flowed to the sea, and consolidating their deltas to form this bit of coastal plain, laid down marls and clays. A period of relative aridity followed in which the winds began to distribute sand over the clay of the plain. The sand became so great a menace to the lives of the rivers that some, failing to keep their mouths open, lost their headwaters to the more powerful neighbors, *e. g.*, the Garonne and the Adour. Not only does the angularity of the present river courses suggest piracy, but the present lagoons at the mouths of the beheaded streams as well.

Russian Rivers.—H. Himner has made some interesting contributions to the studies of certain rivers in parts of Podolia, Russia (*Les Méandres Encaissés et les Conditions du Peuplement, ibid.*, 116-123). His studies pertain to the River Dniester and several of its tributaries. These streams in Podolia have their meandering courses deeply entrenched below an old erosion surface. The rivers are described as in maturity, which must mean maturity in at least the second cycle of erosion. Several cases of piracy are described, and two of the larger cities are situated where a wind gap resulting from domestic piracy has left an attractive valley, available for settlement. The author gives considerable attention to the physiographic control over settlement and life in the district.

Dissected Volcanic Cone in Argentina.—In association with geologic and petrographic studies in the Sierra del Morro in the province of San Luis of Argentina, Franco Pastore has made an interesting contribution to physical geography. Sierra del Morro is a great volcano from which lavas have flowed in various directions. This volcano is, however, much dissected; the rim of the great crater has been changed to a circle of peaks. The radial drainage first established on this mountain is still preserved,

but one of the streams has succeeded in crossing the rim of the crater, and its headwaters reach to various portions within that ancient vent. On the floor of the large crater, three miles in diameter, there are numerous small cones representing a later stage of volcanic activity. The topographic map and cross section give the essential facts in a very graphic way.

Retreat of the Barry Glacier, Alaska.—Further data have been presented on the retreat of the Barry Glacier at Port Wells on Prince William Sound, Alaska (U. S. Geol. Surv. Prof. Paper 98-C). B. S. Johnson, who visited the glacier in 1914, took pictures from the same positions from which Lawrence Martin photographed the glacier in 1910. The average annual retreat between 1910 and 1913 was slightly over 2,100 ft. on the east side, but only a little over 800 ft. on the west side. Between 1913 and 1914 the retreat was 1,700 ft. The change in the form and marginal position of the glacier are shown in excellent illustrations.

Coral Reefs.—An important paper by T. W. Vaughan (*Jour. Wash. Acad. Sci.*, vii, 1916, 53-60) describes certain sublittoral features of the Leeward Islands, West Indies, from which he concludes that the coral reefs there occurring have been, during a recent rise of ocean level, built up on a basement or platform abraded by the ocean while it stood lower. He believes that this explanation applies in several other regions, probably including the reefs of the tropical western Pacific. He concludes that "these changes in the height of sea level accord with the demand of the glacier-control theory," and that the substance demanded by Darwin's theory is unnecessary.

On the other hand, Darwin's theory is regarded as the most satisfactory explanation for the reefs of the Pacific by W. M. Davis, who has published a general statement of the problem (*Sci. Monthly*, April-June, 1916) and several special studies (*Proc. Nat. Acad. Sci.*, ii, 1916). One of the latter discusses the origin of cleft islands which occur exceptionally in the coral seas, and accounts for them as cut by waves while the islands are surrounded by a beach on which corals could not grow; reefs were established only after submergence began. Another study extends the geological history of a certain barrier-reef island (Vanna Nebalavu) in Fiji to the adjacent atolls, and thus gives strong reason for believing that they have been built up during movements of subsidence, as Darwin's theory postulates.

Deserts.—O. C. Lawson contributes, under title of "The Epigene Profiles of the Desert" (*Univ. Cal. Bull. Geol.*, ix, 23-48), the most important contribution to the physiography of desert forms that has appeared in many years. His paper is thoroughly deductive in treatment, but the conclusions reached are supported by the facts with which they are confronted. Wind action is given small value in the discussion. Disintegration and rain wash are given high values. The paper thus serves as a corrective to certain other papers recently published on the arid region of the southwestern United States in which the action of the wind has been much exaggerated.

OCEANOGRAPHY

G. W. Littlehales

Observations in the American Atlantic.—Although the relinquishment of the intended celebration of the opening of the Panama Canal precluded the oceanographical reconnaissance which was to have been accomplished in connection with the trans-Atlantic voyages of European naval vessels, the concurrent investigations, which the programme required in the coastal seas, have been supplied on the American side of the Atlantic. The exploration of the coast water between Nova Scotia and Chesapeake Bay has proceeded annually in the schooner *Grampus* under the joint auspices of the Bureau of Fisheries and the Museum of Comparative Zoology at Harvard College, and Prof. Henry B. Bigelow of Harvard University, under whose supervision these operations are conducted, has regularly published the observations and the deduced results in the *Bulletins* of the Museum. As in previous years, the vessels of the U. S. Coast Guard detailed in the International Ice Observation and Ice Patrol Service have gathered additional data in the region of the Grand

Bank of Newfoundland where the results of oceanographical observations are of economic significance, because the fisheries, which are seasonal, depend upon the periodicity of the hydrographical conditions; and as long as the variations in physical conditions, which determine the migrations of the fishes, remain unknown, the fishermen will continue to be obliged to follow these movements haphazard.

Observations in the American Pacific.—At La Jolla, San Diego, Cal., there has grown up an institution, by the name of the Scripps Institution of Biological Research, whose operations, recently brought under the auspices of the University of California, constitute an exemplar of intensive oceanographical investigation. By systematically and repeatedly tabulating and mapping standardized values of the temperature, salinity, density, currents, and gas content of the water of the Pacific Ocean, serially observed at ascertained intervals of depth from the surface to the bottom in fixed locations, the variations of these physical elements, with time and locality, in their distribution in the depths, have been already revealed to an important extent within the confines of the oceanic tract in the region of the seat of the Institution, stretching from San Diego to Point Conception and embracing an area of more than 10,000 sq. miles. The zoologists consequently have been enabled to produce advanced works interpreting the connection between the form, shape, and mode of life of the organisms of the sea and the special characteristics of the medium in which they live, such as salinity, temperature, light, pressure and motion.

Some notice of the needs of oceanography and of the fruitful rewards to be gained in many departments of science by the pursuit of oceanographical investigations has been taken by the National Academy of Science in connection with the recent consideration of the project for the exploration of the Pacific Ocean.

Evaporation from the Surface of the Ocean.—In an important discussion in the *Annalen der Hydrographie und maritimen Meteorologie* (xliii, 1915, 111-124, 169-178), Dr. W. Schmidt of the Vienna Meteorological Office deduces a new value for the amount of oceanic evaporation. An investigation of the dynamic processes of evaporation led to the result that the amount of evaporation from the surface of the open ocean as determined by Lutgen (*A. Y. B.*, 1912, p. 621) is much too large, since it does not take into consideration the quantity of heat accumulated in the atmosphere through the rise of temperature. Schmidt determines the mean height of the evaporation of oceanic waters to be 2.07 mm. a day, or 76 cm. (30 ins.) a year. Accordingly, the total amount of water evaporated from all the oceans would not be 384,000 cu. km., as stated by Bruckner and after him by Fritsche, but only 273,000 cu. km. The importance of oceanic evaporation in the economy of the hydrosphere and the extent of the departure of the new determination from the values hitherto accepted indicate the desirability of continuing to make observations of wide geographical distribution.

CARTOGRAPHY

W. L. G. Joerg

Cartographical Publications.—Among the year's publications on cartography, two papers deserve mention. The first, by E. A. Reeves, in two forms, "Surveying, Past and Present" (*Jour. Roy. Soc. of Arts*, Sept. 15, 22, and 29, 1916), and "The Mapping of the Earth, Past, Present, and Future" (*Scott, Geogr. Mag.*, Oct., 1916), contains a valuable synopsis of the present status of the mapping of the world. Of the land surface of the globe, one-seventh is accurately surveyed, one-twelfth is mapped from less reliable surveys, two-thirds is known from route and reconnaissance surveys only, while one-seventh is entirely unsurveyed. Two valuable maps, unfortunately poorly reproduced, illustrate the status of the mapping of the world in 1860 and 1916 according to these categories. Such compilations are of fundamental importance; since Bartholomew's maps showing this information by continents for 1890 (*Scottish Geogr. Mag.*, vi and vii, 1890 and 1891) and Hettner's world map (*Geogr. Zeitschr.*,

i, 1895) no such maps have been published. A second paper, "*Les cartes du monde et la carte internationale au millionième*," by Prof. Alphonse Berget (*Revue de Géogr.*, viii, 1915), while containing nothing new, offers a valuable survey of the development of world maps. After a brief discussion of the underlying projections, the development is traced of such important world maps as the Prince of Monaco's bathymetric chart of the oceans, the International Map of the World and the International Aeronautical Map of the World.

Maps in 1:1,000,000.—Both of the important series of maps of Europe in 1:1,000,000, the inception of which was noted in the YEAR BOOK for 1915 (p. 607), have made rapid progress. Of the maps compiled by the Royal Geographical Society of London under the direction of the General Staff, no less than 15 sheets have been issued, bringing the present total up to 27. Several of the new sheets expand the map to the southeast, so that it now includes the greater part of Asiatic Turkey. The new sheets are: O-34 (Stockholm), O-35 (Riga), N-35 (Minsk), M-31 (Paris), L-31 (Lyons), L-35 (Bucharest), K-36 (Sinope), K-37 (Batum), J-34 (Athens), J-35 (Smyrna), J-36 (Konia), J-37 (Erzerum), J-38 (Tabriz), I-36 (Beirut), I-38 (Bagdad).

Of the maps by the French Service Géographique de l'Armée five new sheets are available, making a total of 14: Riga, Petrograd, Kief, Mohilef, and Odessa. On this series relief is shown very effectively in shading, while the British map uses contours.

In the regular series of the International Map of the World, to which both of the above are related, an additional sheet has appeared for the United States: North I-10 (Point Conception). This sheet shows that portion of southwestern California lying south of lat. 36° N. and west of long. 120° W. It continues to the south the San Francisco sheet noticed in the last issue (p. 607) and treats land relief and submarine topography in a similarly effective manner.

Maps of the Eastern and Western War Fronts.—The French Service Géographique de l'Armée has issued a series of maps each for the eastern and western fronts (*Carte du Théâtre des Opérations:* (1) *Front Oriental;* (2) *Front Occidental*). The former is on the scale of 1:1,000,000, comprises 20 sheets, and covers the area included between the parallels of 60° and 44° N. and between the meridians of 14° and 29° E. of Paris. The underlying compilation is the same as that for the French map mentioned in the preceding section. The map of the western front is on the scale of 1:500,000, consists of 15 sheets, and covers the area between 52° and 47½° N. and between 3° W. and 6½° E. of Paris.

Maps of the Balkans.—The title of the important contour map of European Turkey on the scale of 1:250,000, begun in 1908 by the Geographical Section of the General Staff, London (No. 2097), has been changed from "Turkey" to "The Balkans." Five new sheets have been issued: Scutari, Elbasan, Uskub, Monastir, and Kozana. The map is the best large-scale map of its type available for this area. An admirable map of the Balkans in 1:1,000,000 has just been issued by Kümmerly and Frey, Bern. It represents relief in the strikingly plastic manner of the Swiss school, simulating the natural tints and the shadows of the landscape.

Maps of the Gallipoli Campaign.—The ill-fated Gallipoli campaign is perpetuated cartographically on two maps by the Geographical Section of the General Staff, London: (1) "The Peninsula of Gallipoli and the Asiatic Shore of the Dardanelles," 1:63,360 (No. 2285); (2) "The Anzac Position," 1:20,000 (No. 2805). Relief is indicated on the former by 100-ft. contours, on the latter by 10-ft. contours. The latter indicates the position of the British and Turkish trenches as known on Aug. 6, 1915. An excellent map, 1:50,000, in altitude tints, has also appeared: "Orographical Map of the Dardanelles, Reduced from Captured Turkish Maps," Survey Dept. of Egypt, Cairo, 1915.

Physical Maps.—The importance of the physical map was dwelt upon in the YEAR BOOK for 1915 (p. 608). Two important series may be noted. One is the hypsometric map of Sweden, 1:500,000, published by the

Generalstabens Litografiska Anstalt, Stockholm. Of the 17 sheets covering the country, all but three have been published. The color scheme ranges from yellow for the lowlands through light to dark brown for the highlands. The other series is that of "India and Adjacent Countries," 1:1,000,000, published by the Survey of India, Calcutta. In addition to the regular form, a hypsometric edition is being issued. Five sheets have so far appeared: 18 (lower Persian-Gulf region), 39 (Multan region), 53 (Simla-Delhi region), 56 (Hyderabad region), 65 (Vizagapatam region). Two variants of each sheet are issued, one with altitude tints only, the other with shading in addition. The latter is very striking.

Two recent maps of this type are also worthy of mention, one of Dalmatia in 1:500,000 (Istituto Geografico de Agostini, Novara), and the other of the Near East in 1:400,000, comprising Asia Minor, Egypt, northern Arabia, Mesopotamia, and Persia (J. Bartholomew & Co., Edinburgh).

Topographic Map of the Philippines.—The need for a topographic map of the interior of the Philippine Islands has been urgent. To meet this need a Geographical Division was created in the suboffice at Manila of the U. S. Coast and Geodetic Survey. A systematic plan for mapping the entire area of the Islands was outlined and the scale of 1:200,000, or a little over three miles to the inch, selected as giving the greatest amount of detail that the relatively poor knowledge of the topography would allow. There are to be 14 sheets on this scale and one in 1:600,000 (Mindanao). Seven sheets have been published to date: northern Luzon (No. 3), central Luzon (No. 5), southern Luzon, western sheet (No. 7), Tablas, Romblon, and Sibuyan (No. 11), Leyte (No. 14), Cebu and Bohol (No. 15), and Panay (No. 17). Relief is shown by rather characterless hachuring in brown; areal color is used to distinguish the provinces.

New Population Maps.—New methods of mapping density of population and distribution of nationalities are outlined in a suggestive article by B. C. Wallis in the March, 1916, number of the *Geographical Journal*. In both cases the "spot-height" method used in the office plotting of contour lines is applied. The number representing the average population density or racial percentage, as the case may be, for each district is placed in the center of the district and the corresponding lines of designated value are drawn around and about these numbers. The resulting image is one of islands, tongues, and belts. The smallest possible administrative units should be used in the original determination of "spot-heights"; if this is done, the result will be striking in its close approach to existing conditions, as Map C, one of the six maps illustrating the article, shows. The method is especially fruitful in the representation of areas of mixed nationality. Maps E and F, illustrating a section of Hungary inhabited by Magyars, Germans, Slovaks, Rumanians, and Serbians, show, with admirable clarity, the one, the proportion of each nationality in any given area, the other, the relation of Magyar and Rumanian in their zone of contact.

EXPLORATION AND GEOGRAPHICAL RESEARCH

Cyrus C. Adams

Antarctic Exploration.—Polar annals record no more adventuresome and thrilling journey than that of Sir Ernest Shackleton and his comrades between December, 1914, and August, 1916. This party formed the Weddell Sea (Atlantic) branch of the Shackleton expedition. The Ross Sea (Pacific) branch which was sent to that region to give any succor to Shackleton he might need, if he succeeded in crossing the Antarctic Continent between Weddell and Ross Seas, had also a very remarkable experience to be described later.

Shackleton and his personal party sailed from South Georgia on the ship *Endurance* on Dec. 6, 1914. His purpose was to reach the northern edge of the Antarctic Continent at Prince Luitpold Land, discovered by Filchner in 1912. Shackleton knew that

the journey south through the heavy ice-pack would be very slow, and he expected to spend the Antarctic winter on Prince Luitpold Land and set out across the continent for Ross Sea, by way of the South Pole, about October, 1915.

Two days after he left South Georgia, the *Endurance* reached heavy ice near the Sandwich Islands and, skirting the edge of the pack, she finally entered it in lat. 58° 40′ S., and long. 18° W., about 800 miles southeast of South Georgia. The *Endurance* pushed through the formidable ice barrier for about 1,000 miles till Coats Land was sighted. This is supposed to be a bit of the Antarctic Continent discovered by Bruce in March, 1904. Then pounding on for 200 miles to the southwest, about 200 miles of new coast line was discovered which Shackleton named the Caird Coast in honor of James Caird, a promotor of his enterprise. There is reason to believe that this coast is a part of the Antarctic Continent, for large glaciers were descending from it such as come only from great land masses. This was in the Antarctic summer, but there were no summer conditions for the weather was abnormally cold.

When February, 1915, was half gone, the *Endurance* was beset in the ice and was never free again. She was immovably locked in the pack and went zigzagging through Weddell Sea in a general northwesterly direction, just where Shackleton did not wish her to go. Ice pressure nipped her badly and, on Oct. 27, a screwing motion of the thick floe tore out her stern and rudder posts, squeezed the ship's sides in and she was a wreck. All the dogs and equipment were placed on the ice, where the men made their camp. In a few hours, the ship was submerged to her upper deck. The party were now about 600 miles from the South Shetland Islands. They and their supplies were on the ice in the midst of Weddell Sea, which, Douglas W. Freshfield, president of the Royal Geographical Society, says, "has the worst reputation of any sea in the world."

On Oct. 30, 1915, the party undertook the terrible task of dragging their loaded boats northward over the ice; no progress, however, could be made, for the pack was heaving and grinding. Fortunately, the winds were driving the pack slowly northward; so they camped near the wreck of the ship which was moving with them. They made, however, only 60 miles northing in November and progress in December was equally disappointing. At the beginning of January, 1916, they tried again to advance over the floe but made only nine miles in five days. As the ice was becoming soft, they could not drag the boats further, so they camped again, drifting slowly north through January, February and March, crossing the Antarctic Circle in January, killing dogs for food as provisions were getting very low. Joinville Island, off the north extremity of the West Antarctica Peninsula, was sighted on March 23, but many floes made it impossible to reach land. Next day the small floe, on which the party had drifted far, broke up and they had to take to the boats, desperately fighting with heavy seas and drifting ice till April 13.

At this point, Sir Ernest decided to give up his attempt to reach Deception Island to the west, an extinct volcano with a fine harbor in the crater. The party set out for the nearer Elephant Island to the north, where he landed his utterly exhausted party on April 17. A cave was cut in a cliff to serve as shelter; and Frank Wild, well known for his explorations in the western part of Wilkes Land on the Mawson expedition (1912), was put in charge of the 22 men who were left on the island with full rations for five weeks, while Shackleton, with five men and the largest boat, roughly decked with sledge runners and box lids, set out over the stormy sea for South Georgia, some 800 miles to the northeast, to enlist the help of the Norwegian whalers who were known to be there.

The whalers gave every assistance in their power but the ice conditions were exceptionally bad; and though Shackleton came within 20 miles of Elephant Island on his second rescue voyage, it was not till his fourth attempt that he finally reached the marooned men on Aug. 30. He found them well, though they had been stranded for four months and six days

before relief came and Shackleton had been able to leave them only five weeks' supplies. The animal life of Elephant Island, chiefly penguins, had warded off actual starvation though the men had suffered much. This is the second recent occasion on which the penguin has been the salvation of castaway Antarctic explorers. Scott's northern party of six men, on his last expedition in the Ross Sea region, 1912, were absolutely dependent for six months on the game they killed, and at the most crucial period they would have perished, if they had not killed four emperor penguins, dressing 80 lb. of meat each.

Ten months and three days had elapsed since the 27 men of the Shackleton expedition had lost their ship in Weddell Sea. They were then, in a straight line, about 1,200 miles from the nearest abode of men, the whalers of South Georgia. They sledged and drifted on the ice about half the way and finally reached safety without the loss of a man. Their story has no rival of its kind in the history of polar endeavor.

Meteorological and other scientific observations were carried on throughout the drift, and convincing proof was obtained of the non-existence of Morrell's "South Greenland." The most substantial fruit of the drift is the knowledge gained as to the ice conditions and the circulation of the Weddell Sea.

At the very time that the *Endurance* was drifting northward in the ice of the Weddell Sea, Shackleton's other vessel was drifting northward in the ice of the Ross Sea. The *Aurora* had carried the Ross Sea members of Shackleton's party to Cape Evans, Ross Island, where stores were landed and scientific work was under way. On May 6, 1914, the *Aurora* broke from her moorings in a blizzard and drifted north for ten months, moving about 500 miles up the coast of Victoria Land. She lost her rudder in the ice but as soon as she was free a steering gear was provided and she arrived at Dunedin, in New Zealand, on April 3, 1916. Dr. H. R. Mill writes in the *Geographical Journal*, that a comparison of these simultaneous drifts in the Weddell and Ross Seas should prove interesting when the details are received. Ten men who were ashore when the *Aurora* broke away are believed to have sufficient supplies but no news was had of them before the end of the year.

Arctic Exploration. — Stefansson's plans for work in the Beaufort Sea, to the north and west of Banks Island, have been seriously impeded by the ice conditions and the loss of part of his dogs. He was unable to sail up the west side of Banks Island late in 1915 and finally wintered in Prince of Wales Strait between Victoria and Banks islands. The main part of his work was to be the study of the new island he discovered early in 1915, to the north of Prince Patrick Island (*A. Y. B.*, 1915, p. 610), and he started north for this purpose in May, 1916, to remain in the field as long as conditions would permit. No news of his quest has yet been received; a letter from him, dated January, 1916, said that if he failed in that year to reach and explore the land he had discovered, he would try again in 1917, and he asked that a vessel be sent to bring his party home in that year.

Stefansson's southern party, headed by Dr. R. M. Anderson, returned home in the fall of 1916. They had covered the Arctic mainland coast with topographic surveys from Cape Parry (124° W.) to Bathurst Inlet (108½° W). The unexplored Rae River was surveyed for 75 miles from its mouth. This important work will greatly improve the map of this region, which has depended chiefly upon the hurried observations of Sir John Franklin in 1846. Over 150 islands were mapped on the west side of the entrance to Bathurst Inlet where only three had been shown. The work of D. Jenness, the ethnologist, was also noteworthy. From April to November, 1915, he sledged and packed with primitive Eskimos in the interior of Victoria Island; and on the mainland he made large ethnological and archæological collections, including many phonographic records of folklore; and he studied the manners, customs and games of the Eskimo (see also XXVI, *Anthropology and Ethnology*).

The results of Knud Rasmussen's remarkable journey across North Greenland in 1912 were not published

till late in 1915. He and Peter Freuchen started from near Etah on the west coast, sledged across the ice cap to Denmark Fiord on the east coast, then north to Independence Fiord, discovered by Peary, then back to the west coast to Thule, a new station south of Etah. His greatest altitude on the inland ice was 7,298 ft. He discovered, on the north side of Independence Fiord, old Eskimo hut rings, which strengthens the theory that the ancestors of the 500 Eskimo of East Greenland reached that coast by sledging around the northern part of the island. His greatest discovery was that Peary Channel, which was supposed to mark the northern edge of Greenland, does not exist, Peary Land being actually the northern part of Greenland, thus further extending the area of the largest island in the world.

Several members of the Crocker Land Expedition have returned home, but Donald B. Macmillan, the leader, Dr. Hovey, who headed a relief expedition, and others are still in Greenland and a vessel has been sent for the relief of both parties.

America.—The U. S. Coast and Geodetic Survey completed in May, 1916, at Brownsville, Tex., the triangulation that connects the triangulation systems of the United States and Mexico. The United States arc of primary triangulation now extends from the northwest part of Minnesota along the 98th meridian to the Rio Grande; and the Mexican arc from Matamoros on the lower Rio Grande, opposite Brownsville, along the same meridian to its Pacific coast. The arc thus completed is 2,270 miles long. This is a notable geodetic event, and the maps of the two countries may now be made to harmonize at the border.

The Pan-American Railway to connect North and South America is not being carried out as a unit undertaking but seems destined to be fulfilled by the extension of Central and South American railroad systems. The *Geographical Review* (i, 1916, 53) shows that the line between Buenos Aires, Argentina, and Lima, Peru, is approaching completion. Of the whole distance of 2,690 miles, 1,904 miles are completed and 282 miles are under construction. Lima is not strictly on the intercontinental line that passes through Oroya, 128 miles inland from Lima which is connected with Oroya by rail.

Studies recently made by the U. S. Coast and Geodetic Survey have called attention to the importance of the Kuskokwim River, Alaska. After the Survey completed its chart of the approach and entrance to the river in 1915, it made a reconnaissance survey inland from Bethel, the head of deep-water navigation, for 550 miles to McGrath, the main settlement on the upper river, from where, on a clear day, Mt. McKinley may be seen 150 miles eastward. A steamer may ascend 200 miles above McGrath, and the river with its tributaries offers 1,200 miles of navigation. The first good determinations of positions along the river were made in 1915. Very fair grazing and agricultural opportunities are reported.

Africa.—Sir Alfred Sharpe, one of the last British explorers to return from Africa before the war, published in 1916 an account of a tremendous eruption he witnessed among the Mfumbiro volcanoes, north of Lake Kivu and on the border between the Belgian Congo and German East Africa. The volcanic phenomena of this district are far more active than in any other region of Africa. Sharpe writes that when he first saw the glow of the eruption, he was 70 miles from the volcano. The detonations were heard by Cuthbert Christy 200 miles to the northwest. The eruption was the outbreak of a new volcano on nearly level ground at the northwest corner of Kivu. Sharpe found that the volcano had developed a large crater and was pouring out fine ash and lava. A broad river of swiftly flowing lava poured into Kabino Inlet at the northwest corner of the lake and the water was boiling. A canoe filled with natives was crossing the lake and the unfortunates were overcome by steam and fumes so that the boat drifted into the boiling water and sank. Many birds and small mammals were killed by falling lava.

The same explorer also crossed the high plateau of Ruanda, to the east of the volcanic district, which stands so high above the sea that it is expected to be a future reserve for prosperous

white settlement. It is 8,000 ft. above the sea and Sharpe describes its climate as "a succession of English summer days." The herds of the natives are estimated at 2,500,000 cattle.

The Cape to Cairo Railway now extends south from Cairo to Sennar on the Blue Nile. Sir Charles Metcalfe, long connected with Cecil Rhodes as engineer of railway construction in South Africa, in a paper on "Railway Development of Africa" (*Geogr. Jour.*, xlvii, 1916, 3-21) expresses the opinion that one result of the war will be the completion of an all-rail line between Cape Town and Cairo without using any of the proposed links of river navigation. He says that the through rail route may be attained by building a railway northeast from the station of Broken Hill, in northern Rhodesia, to Tabora in what is still known as German East Africa, thence nearly due north to Sennar, where the last rail on the Cape to Cairo route would be laid. If this idea be carried out, considerably more than one-half of the track has already been laid. Some years before the war the British intimated that, in their opinion, the best route for the railway would be across German territory but the idea was not favorably received by the German authorities.

Pacific Islands.—The large region in northeastern New Guinea which the Germans appropriated in 1884 under the name of Kaiser Wilhelm Land is still little explored and that mainly along the coast, some of the interior ranges, and along the Kaiserin Augusta River. The impression that the larger river basins are so low in elevation as to present many obstacles to development has been modified by more recent work. When the war began the well-known German ethnologist, Dr. R. Thurnwald, was making studies in the upper basin of the Kaiserin Augusta River, one of the most important river systems of the great island, when he discovered an important extent of elevated country to the west-southwest of the Victor Emanuel Range. He found this plateau to be about 5,000 ft. above the sea and fairly well peopled, quite in contrast with the Kaiserin Augusta Valley further east, which stands low and is very sparsely settled. The amenities are not observed by explorers when war disturbs friendly relations. While Dr. Thurnwald was on this journey an Australian military expedition reached his base camp and departed with his motor boat and supplies, so that he had difficulty in returning down the river. This was his first intimation that a state of war existed. The Australians now occupy Kaiser Wilhelm Land, report healthful country inland in the mountain region back of the Hansemann Coast, and ask that a road be built from the coast to the Ramu River, which drains nearly the whole of southeastern Kaiser Wilhelm Land, with a view to opening up the interior.

The Southern Ocean.—There is a growing tendency among geographers to discontinue in their writings, maps and text-books the use of the name Antarctic Ocean as applied to the widespread waters to the south of the Atlantic, Pacific and Indian Oceans. Perhaps the late Prof. Otto Krümmel, one of the greatest of oceanographers, gave more impetus to this tendency than any other writer, when he discarded the name Antarctic Ocean in his *Handbuch der Ozeanographie* and divided these southern waters of the globe among the three oceans to the north. The present tendency, however, seems to favor the substitution of the name "Southern Ocean" for Antarctic Ocean and to extend its northern limits to lat. 40° S. The northern limit of the Antarctic Ocean is, of course, the Antarctic Circle. The reason given for this change of name is that the southern waters of the world have distinctive phenomena or features which differentiate them, to some extent, from the other oceans; and that the name Antarctic Ocean is not appropriate because it does not include the entire water area that is marked by these special features or some of them. The latest and one of the best English text-books does not mention the Antarctic Ocean but uses the name Southern Ocean. We see the name also used in one of the latest and most important American text-books, and some other texts now preparing will adopt the new name. It seems probable that, before very long, the designation Antarctic Ocean will no longer be used.

XXIV. CHEMISTRY AND PHYSICS

CHEMISTRY

INORGANIC AND PHYSICAL CHEMISTRY

ARTHUR WESLEY BROWNE

Water.—The effect of dissolved substances on the velocity of crystallization of supercooled water at —9.1° C. has been studied by J. H. Walton and A. Brann. All of the 45 solutes employed, including both inorganic and organic substances, were found to retard the velocity of crystallization. As the result of a second investigation the authors have concluded that this effect is due, in part at least, to the existence of hydrates in solution, since the substances that are most hydrated show the greatest retarding influence. The molecular weight of water dissolved in phosphorus oxychloride and in nitrogen tetroxide has been determined by G. Oddo. After a general review of the subject he reaches the conclusion that liquid water is composed chiefly of double molecules, or dihydrol, which shows the properties of a definite chemical individual. The specific conductivity of pure water in equilibrium with atmospheric carbon dioxide has been measured by J. Kendall, who affirms "that carbon dioxide is the only substance in the atmosphere which confers conductivity on water," and that "the purest distilled water of the laboratory is, in point of fact, a saturated solution of carbonic acid under the existing atmospheric conditions."

Hydrogen Peroxide.—The velocity of decomposition of hydrogen peroxide in aqueous solution at 50° and at 60° has been determined by W. Clayton. The purity of the water used was found to have marked effect upon the rate of decomposition, which was 50 times as rapid in tap water as in water of low specific conductivity. G. Lemoine has studied the catalysis of hydrogen peroxide in heterogeneous media, noting the respective action of mercury, platinum, various oxides, and carbon. A. Tian has investigated the transformations and the chemical equilibrium of water and solutions of hydrogen peroxide exposed to ultraviolet light. The partition coefficients of hydrogen peroxide between water and certain organic solvents have been determined by J. H. Walton and H. A. Lewis, while the action of various compounds that decompose catalytically solutions of this substance in various organic solvents has been studied by Walton and Jones. It is stated by J. Sperber that hydrogen peroxide, or "peraquatic acid," will liberate nitric acid and sulphuric acid from certain of their salts under suitable conditions. A mixture of hydrochloric acid and hydrogen peroxide has been found by E. Salkowski to dissolve copper, bismuth, nickel, gold, platinum, and antimony, but not silver or mercury. Dilute sulphuric acid with hydrogen peroxide will dissolve copper, silver, nickel, and bismuth, while acetic acid with the peroxide dissolves copper, silver, mercury, lead, and bismuth.

Hydrogen.—The mechanism of the reaction involved in the dissociation of hydrogen into atoms has been further studied by I. Langmuir (see *A. Y. B.*, 1915, p. 613), who finds that the velocity with which hydrogen is dissociated when brought into contact with a heated tungsten wire is so enormous that the reaction cannot be considered to depend upon diffusion of hydrogen into the metal. Langmuir applies his new general theory of heterogeneous chemical reactions to this case, and concludes that the dissociation takes place upon the surface of the wire, although only a negligible fraction of the surface is covered at

any time. A chemically active modification of hydrogen has been obtained by W. Duane and G. L. Wendt by exposing a stream of purest hydrogen to intense ionization by *alpha* rays from radium emanation. This active hydrogen was found capable of reducing sulphur, phosphorus, and arsenic to their hydrides, and of decolorizing potassium permanganate. Similar treatment of a closed volume of hydrogen produced a contraction possibly indicative of the formation of the polymeric form H_3. A. J. Dempster succeeded in obtaining mixtures of H, H_2, and H_3 particles by ionization of hydrogen by electrons from a Wehnelt cathode, and deflection of the positive particles by means of electrostatic and magnetic fields. The polymer H_3 was found to be unstable.

Nitrogen.—It has been shown by R. J. Strutt that active nitrogen may be most efficiently obtained by means of the jar discharge, although this method has several disadvantages. Active nitrogen is produced by the spark even at atmospheric pressure, but the phenomena are much less striking than at low pressures, because of the destructive action of the surrounding gas on the active nitrogen. E. Weitz has prepared a number of new nitrogen compounds of gold in connection with his study of the interaction of ammonia and chlorauric acid and of related reactions. Among the compounds described were, for example, monoammineauric oxide (Au_2O_3. $2NH_3$), tetrammineauric nitrate ($Au(NH_3)_4(NO_3)_3$), as well as the tetrammineauric phosphate, oxalate-nitrate, perchlorate, iodate, chromate, and numerous others. The constitution of nitrogen tetroxide has been studied by G. Oddo from the viewpoint of the chemical behavior of this substance in various solvents toward water. He suggests that the name "hypoazotide" be used for NO_2, which he considers to be a compound distinct from the true tetroxide, N_2O_4. The molecular weight of the substance in various solvents was determined in connection with this investigation. F. Ephraim and E. Bolle have measured, over a short range, the pressure-temperature curves of the ammonates $Cu(NO_3)_2.4NH_3$, $Cu(NO_3)_2,6NH_3$, $Cu(ClO_4)_2.6NH_3$. $CuS_2O_3.4NH_3$, $CuS_2O_6.5NH_3$, $CuS_2O_6,6NH_3$, $CuS_4O_6.4NH_3$, $Cu(CSN)_2.6NH_3$, $Cu(CNS)_2.4NH_3$, $Cu(CO_2H)_2.4NH_3$, and $CuC_2O_4.5NH_3$, and have computed the "absolute temperature of dissociation" and the heat of formation of these compounds.

Nonaqueous Solutions.—An interesting series of investigations has been carried out by P. Walden on the behavior of benzene, naphthalene, tetrachloromethane, carbon bisulphide, cyclohexane, chloroform, and methylene chloride as solvents for various salts and other electrolytes. It was found that in many cases "solvolysis" or "solvolytic dissociation," analogous to hydrolysis or hydrolytic dissociation, and independent of electrolytic dissociation took place. Solution of a salt in one of these "indifferent" solvents may result in polymerization to such a degree that the rise in boiling point becomes zero or even negative, or it may result in the formation of solvates, in solvolysis, or in ionization. The conductivity and viscosity of solutions of 18 inorganic and two organic electrolytes in formamide have been measured by P. B. Davis, W. S. Putnam and H. C. Jones. The association factor of this solvent was found to be 6.18, the highest value obtained for any solvent studied by (the late) Professor Jones. H. I. Schlesinger and C. Coleman have continued their study of the behavior of the alkali metal formates in anhydrous formic acid. The interaction of chromyl chloride and the phosphorus trihalides in carbon tetrachloride has been investigated by H. S. Fry and J. L. Donnelly. The conductivity of various acids in absolute and in aqueous alcohol has been determined by H. Goldschmidt, and the electromotive forces of certain concentration cells containing alcoholic solutions, with calomel electrodes, have been measured by E. Newbery.

Boron and Silicon.—The chemical behavior of boron nitride has been studied by U. Sborgi, with especial reference to the decomposition of this substance by water vapor. A new system of nomenclature for the compounds of boron and of silicon has been proposed by A. Stock. It is suggested, for example, that the hydrides of silicon be termed "silanes," so that

SiH_4 would be called monosilane; Si_2H_6, disilane; and Si_3H_8, trisilane. Stock and Somieski have investigated the hydrides obtained by the action of hydrochloric acid upon magnesium silicide. The carefully purified inflammable gas yielded a number of different hydrides when cooled with liquid air and then fractionally evaporated. In addition to the compounds SiH_4 and Si_2H_6, were obtained for the first time trisilane, Si_3H_8; tetrasilane, Si_4H_{10}; pentasilane, Si_5H_{12}; and hexasilane, Si_6H_{14}.

Vapor Pressure Determinations.—The dissociation pressures of calomel for temperatures between 309° and 384° C. have been measured by A. Smith and R. P. Calvert, with the aid of the static isoteniscope heated in a bath of molten sodium and potassium nitrates. Using the static method of Smith and Menzies, I. H. Derby and V. Yngue have determined the dissociation pressures of the hydrated chlorides of magnesium, copper, cobalt and nickel, and also the vapor pressures of the saturated solutions of these compounds. The lowering effect upon the vapor pressure of water produced by dissolved potassium chloride has been studied by B. F. Lovelace, J. C. W. Frazer and E. Miller. It was found that for all concentrations investigated, the molecular lowering of vapor tension was the same. An electrically operated thermostat capable of holding the temperature constant to 0.001° for periods of 12 hours or more was employed in this work. C. Drucker, E. Jiméno and W. Kangro have determined the vapor pressures of a number of organic liquids for temperatures between the limits + 15° and — 100° C.

Radium and Radioactive Substances.—In the effort to discover the cause of the startling differences observed by several investigators (see *A. Y. B.*, 1915, p. 615) in the atomic weight of lead from radioactive sources, T. W. Richards and C. Wadsworth have determined the density of ordinary lead (atomic weight, 207.2) and of lead from Australian radioactive sources (atomic weight, 206.3). A difference in density was found, which "almost exactly parallels the difference in atomic weight. Thus the atomic volume of radioactive lead is found to be almost exactly equal to that of ordinary lead." In a later investigation, the density of lead (atomic weight, 206.08) from Norwegian cleveite was found to be even lower than that of the Australian radio-lead, while the atomic volume, as before, proved to be "essentially equal to that of ordinary lead." An experimental determination of the life of radium has been made by Ellen Gleditsch, who used the Boltwood method, obtaining values for the half-life period which in some cases agreed closely with the value (1,690 years) calculated by Rutherford from the number of *alpha* particles emitted per second per gram of pure radium.

Halogen Compounds.—The changes in volume that take place when the halogen salts of the alkali metals are dissolved in water have been measured by G. P. Baxter and C. C. Wallace over a wide range of concentration and of temperature. The observed effects are explained with the aid of Richards' hypothesis of compressible atoms and of the hydration hypothesis. L. Marino and R. Becarelli have studied the so-called sub-bromide and sub-chloride of bismuth, and conclude that when mixtures of bismuth bromide and bismuth, or of bismuth chloride and bismuth, are fused, no evidence of the formation of a well defined sub-bromide or sub-chloride is observed, but that in each case a series of mixed crystals is obtained. An investigation of chlorous acid and the chlorites has been conducted by G. Bruni and G. Levi. A number of chlorites were prepared, and the molecular conductivity of the solutions of certain chlorites was determined. It was found that the ionic mobility of the oxygen compounds of chlorine seems to increase with the amount of oxygen present, while that of the oxygen compounds of nitrogen decreases. Solutions of sodium chlorate activated by osmium have been used by K. A. Hofmann and O. Schneider in effecting the separation of hydrogen from methane or nitrogen and the catalysis of mixtures of oxygen and hydrogen.

The Periodic System.—A very interesting article on the periodic system and the properties of elements has been published by W. D. Harkins and R. E. Hall. The authors present a new

table, which may be shown either as a helix in space or as a spiral in one plane. In this table the elements are arranged in the exact order of their atomic weights, with no blanks for unknown elements that do not correspond with the Moseley atomic numbers, but with adequate provision for the zero and eighth groups, for the *alpha* and *beta* decompositions of the radioactive elements, and for the isotopic forms of an element. It is suggested by J. Waddell that the relationship between the atomic weights of the elements and the quantity in the earth's crust can scarcely be accidental. The fact that the "typical elements" sodium, magnesium, aluminium, silicon, phosphorus, and chlorine occur in much larger amounts than the remaining elements in the respective groups, leads the author to believe that oxygen, the most abundant of all elements, may be in reality the typical element of its group, and that the unknown element of atomic weight between hydrogen and helium may be the first member of the oxygen group, instead of being analogous to the halogens as previously suggested. In an article on the atom and the molecule, G. N. Lewis suggests the classification of compounds as polar and non-polar, rather than as inorganic and organic. In polar molecules certain electrons are held so weakly as to permit motion from their normal positions, with resultant separation of the molecule, in extreme cases, into positive and negative parts. In non-polar molecules the electrons belonging to the individual atom are held in such constraint that they do not move far from their normal positions. A new theory of atomic structure is proposed, in which the atoms of lithium, beryllium, boron, carbon, nitrogen, oxygen, and fluorine, for example, are represented as cubes, carrying respectively from one to seven electrons on the corners.

Miscellaneous.—The compressibility of certain typical hydrocarbons, alcohols and ketones has been measured by T. W. Richards and J. W. Shipley. An extended study of polymorphism at pressures up to 12,000 kg. per square centimetre and at temperatures between 0° and 200° C. has been made by P. W. Bridgman. About 150 substances were found to show polymorphism, while 94 substances did not undergo polymorphic transition. A series of cryoscopic measurements at low temperatures has been made by H. S. Reid and D. McIntosh upon the solutions of a number of organic substances in liquid hydrogen bromide. Information was gained concerning the molecular complexity of certain solutes, the relationship between the amount of association and the molecular conductivity, and the formation, in certain cases, of oxonium compounds. The formation of supersaturated solutions of phenol, aniline, nitrobenzene and carbon bisulphide in water has been investigated by H. S. Davis, and a theory has been suggested to account for the observed phenomena. J. L. R. Morgan and G. Egloff have measured the surface tension of mixtures of phenol and water, and of triethylamine and water, both above and below the critical solution point, by the drop-weight method. The ternary system silver, gold, tellurium, or, more accurately, silver telluride, gold telluride, tellurium, has been investigated by G. Pellini. The system calcium oxide, aluminium oxide, magnesium oxide has been studied by G. A. Rankin and H. E. Merwin. No ternary compounds stable in contact with the melt were found. A series of concentration-temperature diagrams was constructed, in which are shown the relations subsisting between the components and the binary compounds $3CaO.Al_2O_3$, $5CaO.3Al_2O_3$, $CaO.Al_2O_3$, $3CaO.5Al_2O_3$, $MgO.Al_2O_3$, and the relations in the ternary system.

ORGANIC CHEMISTRY

J. Bishop Tingle

General Survey.—A survey of the literature of organic chemistry for the year 1916 leaves the impression that up to the present the European War has exerted but little influence on either the nature or the quantity of research. The volume of publication is very large, but the overwhelmingly greater portion of it consists of instalments of work planned to extend over many years; of details which are of interest only to a very limited number of specialists, or of work, the

results and conclusions of which can only be regarded at present as being tentative.

Coal.—The effect of iron pyrites on the oxidation (spontaneous combustion) of coal has been a matter of controversy. Different investigators and commissions of inquiry have reported diametrically opposite conclusions. This has arisen, in part, from differences in the nature of the coals in question and in part from the quantity of moisture present in the "dry" coal. Some observers have applied the term "dry" to coal which has been deprived of its natural moisture, whereas others have used it to indicate coal as obtained from the mine. T. F. Drakeley has pointed out (*Trans. Chem. Soc.*, cix, 733) the influence of the state of aggregation of the iron pyrites. He concludes that the effect of the pyrites on the oxidation of coal is not negligible, and that the effect is much greater when the pyrites are finely disseminated throughout the coal than when occurring in nodules. It follows from this that the quantitative determination of the pyrites in a sample of coal is not sufficient to enable a conclusion to be drawn regarding the spontaneous combustibility of the coal. D. T. Jones and R. V. Wheeler (*ibid.*, 707) have investigated the composition of coal and concluded that it has been formed from decayed vegetable matter by pressure, at temperatures not exceeding 300° C. Coal consists of cellulosic and resenic materials which can be separated by treatment of the coal with appropriate solvents. The former when distilled at a low temperature yields phenols. The resenic constituents have become polymerized and consist of cyclic oxides, together with alkyl, naphthene, and unsaturated hydroaromatic compounds. When distilled at a low temperature these yield hydrocarbons containing only a small proportion of paraffins. Petroleum under similar conditions does not yield phenols, therefore its origin is probably noncellulosic. Coal does not appear to contain free carbon.

Caoutchouc.—The patent literature shows that the German chemists continue their efforts to obtain material for the production and manufacture of synthetic rubber. The most important contribution to the chemistry of caoutchouc, since its synthesis by Tilden, has been made by I. I. Ostromisslenski in numerous papers (*Jour. Russ. Phys. Chem. Soc.*, xlvii, 1374). He finds that the formation of caoutchouc from isoprene is preceded by that of β-myrcene, $CH_2:CHC(CH_3):CHCH_2CH_2C(CH_3):CH_2$, which then polymerizes to caoutchouc. This reaction very possibly represents the only synthesis of natural (Para) caoutchouc. Tropical plants probably synthesize caoutchouc from β-myrcene, or analogous compounds, and not from isoprene, because their sap contains alcohols, such as geraniol, linalool, nerol, etc., which by simple dehydration could yield myrcenes. The same chemist has investigated also the processes of vulcanization. The elastic properties of caoutchouc and its ability to be vulcanized with sulphur are associated with a more or less typical state of matter termed the "elastic" or "caoutchouc" state. It is exhibited only by amorphous, colloidal compounds of high molecular weight, and its degree of stability varies widely. Substances capable of existence in this state are termed "resinoids" (Russian rezina-caoutchouc). The elastic condition exists only within certain definite ranges of temperature. Thus natural caoutchouc becomes leathery below 20° C. The "temperature of elasticity" is that at which the substance transforms into the elastic condition, and the "fatal temperature" that at which the elastic properties are lost. These temperatures vary with the composition and structure of the caoutchouc and are affected by admixture with foreign substances and also by vulcanization.

C. Harries (*Ber. Deutsch. Chem. Gesell.* xlix, 1196, 1390) has investigated the vulcanization of caoutchouc from a different point of view. He finds that "purified" caoutchouc although chemically comparable with the natural material has quite different colloidal properties which it has acquired by the process of precipitation. Vulcanization by the "hot" process, as used in making rubber tires, consists of two reactions. The primary change consists simply in an absorption of sulphur. Then fol-

lows an "after-vulcanization." This can be catalyzed by lead oxide. Vulcanization, therefore, involves the change of metastable natural caoutchouc into the stable vulcanizate. Consequently sulphur is not essential to the change, and therefore other substances should be capable of causing vulcanization. The change is, however, now wholly one of colloidal conditions because natural caoutchouc and the desulphurized vulcanizate give different hydrochlorides and the vulcanizate if revulcanized by the hot method gives a less elastic product. Only natural (metastable) caoutchouc has the necessary colloidal characteristics ("emulsoid" form) for the production of good rubber, and the problem of the regeneration of caoutchouc is not the extraction of sulphur but the revival of the original colloidal properties.

Bread.—The staleness of bread is not due to drying alone, and the gluten is not affected. The process is confined to the starch grains, which become harder and less absorbent, the polysaccharides becoming less soluble. The water given up by the starch is absorbed by the gluten, which becomes separated from the starch by air spaces. Aldehyde vapour inhibits staleness; light has no effect. The presence of water vapour does not prevent staleness. (E. Verschaffelt and E. von Tentem, *Zeit. Physiol. Chem.*, xcv, 130; J. R. Katz, *ibid.*, 104, 136, 147, and xcvi, 280, 314.)

Hydrolysis.—James Kendall and James Eliot Booge (*Jour. Am. Chem. Soc.* xxxviii, 1712) have prepared a number of compounds of esters and acids, the formation of which lends support to the theory that the catalysis of ester hydrolysis by acids depends on the formation of intermediate additive compounds.

Quinquevalent Nitrogen.—Of the numerous compounds of the type of ammonium chloride, NH_4Cl, which are known, all agree in having the fifth valency of the nitrogen united to an acidic radicle, the other four being wholly or in part combined with hydrocarbon complexes. It has been assumed, therefore, that the fifth valency of nitrogen differed in its nature from the other four and many rather finely spun theories have been evolved to account for this supposed difference. The whole question will require reconsideration in consequence of the preparation by W. Schlenk and J. Holtz (*Ber. Deutsch. Chem. Gesell.*, xlix, 603) of the compound triphenylmethyl tetramethyl ammonium $(CH_3)_3CN(CH_3)_4$, in which all five of the valencies of the nitrogen are united with hydrocarbon radicles.

Gelatin Swelling.—The absorption of highly dilate acids by gelatin is considered by J. H. Proctor and J. A. Wilson (*Trans. Chem. Soc.*, cix, 307) to depend on the formation of salts of the gelatin and acid. They deduce a general law for the swelling of all proteins, which, if confirmed, will be applicable to numerous physiological and medical problems, such as the fertilization of eggs, œdema, production of muscular energy (muscular contraction), plant growth, semi-permeability of vegetable membranes, and the swelling of carbohydrate jellies, such as starch, cellulose, agar-agar, etc.

Synthetic Medicines.—The search for synthetic medicines continues actively. A. Mouneyrat has obtained an English patent (*Jour. Soc. Chem. Ind.*, xxxv, 72) for compounds containing arsenic and phosphorus, which are only slightly toxic but which possess marked sprillicidal and trypanosomicidal properties. Salvarsan combines with cupric chloride to form the compound $C_{12}H_{12}O_2N_2As_2.2HCl.CuCl_2$. It is very effective against trypanosomes, and the curative dose is only 15 per cent. of the lethal dose. (P. Ehrlich and P. Karrer, *Ber. Deutsch. Chem. Gesell.*, xlviii, 1634.)

BIOLOGICAL AND FOOD CHEMISTRY

CARL L. ALSBERG

Food Accessories.—It is becoming clear that a perfect diet must contain sources of energy, such as fats and carbohydrates, suitable mineral salts, such proteins as contain in combination certain amino acids, and also at least two types of substances: the one, fat soluble, to be found in some oils and fats, necessary for growth; the other, water soluble found in flesh, in certain seed tissues and in green plants, preventing the development of such so-called deficiency diseases (*A.*

Y. B., 1915, p. 618) as beriberi or scurvy. These two types of substances are now known as "food accessories." Williams has made synthetically oxypyridines that resemble the natural water-soluble substances in their curative power toward the polyneuritis or beriberi of rice-fed birds. Like the natural ones, these synthetic substances readily lose this curative power. This is due to the spontaneous change of the active synthetic substance into an inactive isomeric form, through keto-enol tautomerism. It is possible that the betain forms alone are active. Despite the work of the past decade upon the "deficiency diseases," some investigators have clung to the idea that restricted diets producing these diseases contain toxic elements which are a factor in the genesis of disease. This is now supported by the observations of McCollum, Simonds and Pitz that wheat germs contain a substance, removable by ether with the germ oil, the toxic action of which does not appear upon a generous diet; but which may become evident when the protein of the diet is incomplete or the diet is otherwise unsatisfactory. At the same time Voegtlin has shown that animals upon a diet of highly milled flour can not maintain themselves. This, of course, is not to be taken to mean that such flour is in the least unwholesome, but merely that a diet consisting of little other than products made from such flour is inadequate. Animals upon such a diet show chemical changes in the lipoids of the nervous system which are similar to those found in the nervous system of human beings suffering from pellagra. Goldberger has found that the earlier stages of pellagra, like beriberi, may usually be cured by a suitable diet. Whether, as he maintains, a diet lacking in food accessories is the cause of the disease still remains to be determined finally. It has been found that while cottonseed flour deserves extensive use as a food as well as a feed (Richardson and Green) it is an incomplete food (Wells and Ewing) so that the cottonseed meal poisoning of domesticated animals is believed to be a deficiency disease similar to beriberi (Rommel and Vedder).

Metabolism.—McCollum has shown that in young animals the growth impulse is so great that the synthesis of the body protein is effected at the maximum rate possible with the particular mixture of amino acids yielded by the food protein. The rate of retention of nitrogen in all cases where a sufficiently high plane of protein intake was fed was limited by the chemical make-up of the food proteins and not by the physiological capacity of the animal to grow. This has also been demonstrated by Osborne and Mendel, who found that the most rapid gains in body weight are made with lactalbumin. To produce the same gain in body weight 50 per cent. more casein than lactalbumin are required, and of edestin nearly 90 per cent. more. Some, if not all, of the amino-acids (*A. Y. B.*, 1914, p. 618; 1915, p. 619) occurring in combination in the protein molecule have specific functions in the animal economy aside from the function of serving simply as structural units in the elaboration of the body proteins (Osborne and Mendel, Mitchell, Alsberg). It appears, therefore, that the requirements of the animal organism for amino acids resembles its requirements for inorganic ions, in that for maintenance of life over long periods of time a complete assortment both of amino acids and mineral elements is essential, while at the same time each essential amino acid and mineral element has a specific function in metabolism. Thus incomplete mixtures of either amino acids or minerals will partially cover the body's requirements in the proportion of their completeness, though the elaboration of new tissue, and probably the efficient repair of old tissue, will be impossible in the absence of only one of the essential constituents (Mitchell). It has long been known that the fat of the food is converted in the intestines into soap and absorbed as such. In its passage through the intestinal wall it is changed back to fat. How this is accomplished was not known. Bloor has shown it to be exceedingly probable that the blood cells convert the soap into lecithin, a lipoid containing the nitrogenous base cholin and glycerophosphoric acid as well as fatty acids. Bloor believes lecithin to

be an important intermediate step in fat metabolism. There is in the blood cells and in other tissues an enzyme which decomposes lecithin (Foà, Thiele). If this reaction is reversible so that the enzyme is capable of synthesizing lecithin as well as decomposing it, the mechanism of the lecithin formation observed by Bloor could be explained simply.

Internal Secretions.—The results of the important investigations upon the organs furnishing some specific chemical substance which passes directly or indirectly into the blood stream (*A. Y. B.*, 1915, p. 619) have been collected and critically discussed by Schäfer under the title *The Endocrine Organs*. Canon has been able to produce oversecretion of the thyroid gland experimentally. The parathyroid gland has been much studied. The suprarenal glands, it has long been known, contain cells which are colored brown by chromic acid, and are therefore known as chromaffine bodies. They are also found elsewhere as in the carotid gland and the sympathetic nerves and ganglia. Physiologists therefore speak of a chromaffine or chromaphil system and this has been studied intensely (Stewart Schäfer, Haskins). Carlson has found that the substance, secretin, which is furnished to the blood by the mucous membrane of that part of the intestines just below the stomach, for the purpose of stimulating the pancreatic gland to secrete its digestive enzymes into the intestines, has no action when fed. Frank has found that the corpus luteum of the ovary contains a substance capable of producing hypertrophy of the uterus (Pearl). The pineal gland, which in the higher animals is found in the upper part of the brain, is believed to have relations to the sexual organs, though our knowledge of these relations is still vague. That the posterior lobe of the pituitary gland at the base of the brain contains substances which cause a rise in the blood pressure and stimulate the muscle of the uterus has been known for some time. It has long been surmised that the anterior lobe of the pituitary gland at the base of the skull has to do with growth since it is found diseased in certain cases of gigantism and in the disease akromegaly, which is characterized by abnormal growth of parts of the skeleton. Robertson has reported that the anterior lobe of the pituitary gland yields a substance, which he termed "tethelin," which, when fed to young animals, influences growth and development. The preparations obtained by Robertson, which may not be pure, yield inosite when hydrolized, and may be of lipoid nature. Anderson and Bosworth have found that inosite fed to animals can only be recovered to a slight extent in the excreta. No appreciable effects upon metabolism were noted. (See also XXVII, *Anatomy*, and *Physiology and Pharmacology*.)

Lipoids.—Levene and West have made important contributions to the chemistry of cerebrin, cephalin, cerebronic acid, and sphingomyelin. The last is probably the same in all the tissues. Methods have been perfected for the determination of lecithin and cholesterin by means of which their distribution in the tissues under physiological and pathological conditions have been determined. The value of cholesterin in growth has again been pointed out (Robertson).

Proteins, Plant Chemistry.—Levene and Lopez-Suarez have separated *d*-glucosamine from the mucin of the pig's stomach, thus establishing the first chemical point of distinction between true mucin and mucoid. The alcohol-soluble protein from kafir, a grain sorghum, contains some of the amino-acids that are not found in zein, the corresponding protein of Indian corn (Johns and Jones). This indicates that the feeding value of the grain sorghums, suitably used, is probably greater than is ordinarily assumed. It is to be hoped that in consequence the grain sorghums will be more widely used, since they represent one of the few dependable drought-resistant crops for dry-land agriculture. Their production is limited largely by the narrowness of their market. During the year the high price of Indian corn caused a considerable use of the grain sorghums in the production of alcohol. In Germany, owing to the limitation of output of breweries and distilleries by war measures, their equipment has been used to produce yeast from glu-

cose and the ammonium sulphate obtained from coal tar. The yeast, which is rich in protein, is used as a stock food. While yeast has long been used as a stock food, this is perhaps the first occasion when protein has been produced on a large commercial scale for food or feed without the intervention of green plants growing upon the land. However, while German investigators report yeast to be a good feed, Funk states that only a part of its protein can be utilized by animals. From the peanut two globulins have been separated which are rich in those amino-acids which are essential in the diet (Johns and Jones), indicating that the peanut should prove a most valuable supplemental feed to the grains that are deficient in these amino-acids (see also XVII, *Agriculture*). It has been found that most of the studies on the physiological rôle of hydrocyanic acid in plants require revision because the methods hitherto used for its estimation are faulty, in that it was not known that in macerating plants hydrocyanic acid disappears, probably through condensation with some other substance (Alsberg and Black, Viehoever and Johns). Studies have been made to show that the permeability of plant cells to substances in solution depends upon surface-tension effects (A. J. Brown and Tinker, Traube, Czapek). It is as yet too soon to estimate the value of these studies as compared with those made upon the relation of osmotic pressure and ionization to cell permeability. From the avocado La Forge has separated *d*-manno-keto heptose, the first sugar with seven carbon atoms found in nature. (See also *Agricultural Chemistry, infra.*)

Food and Drug Control.—During the year Congress enacted laws providing for Federal supervision of the grading of grain shipped in interstate commerce, for the standardization of boxes and baskets for the shipment of grapes and other fruit, and providing a standard barrel (see also XVII, *Agriculture,* and *Agricultural Legislation*). The General Revenue Act modified the tax on wine and liquors and provided that a limited amount of water may be used in the manufacture of wines under the supervision of the Bureau of Internal Revenue. Bills were introduced, which after much controversy failed to pass, providing for the Federal inspection of dairies and creameries and amending the oleomargarine laws. Other bills which failed to pass covered the requirement that manufacturers, producers, canners, and packers place their names and addresses on labels of packages of foods; the branding of imported hops; the manufacture, sale, and shipment of alcoholic liquors; standards of maturity for oranges; and the repeal of the mixed-flour law.

In U. S. *v.* 408 Barrels of Oysters (Unreported, F. & D. No. 7036) it was alleged that the oysters were "filthy, putrid and decomposed" within the meaning of the Food and Drugs Act because they were polluted with sewage. The case was decided favorably to the Government. The U. S. Public Health Service made extensive sanitary surveys to locate the polluted oyster beds on the Atlantic seaboard, and also showed that polluted oysters could be cleansed by floating in sea water containing hypochlorite of lime. In U. S. *v.* 40 Barrels and 20 Kegs of Coca Cola (241 U. S. 265, Circular 86, Office of the Solicitor of the U. S. Department of Agriculture) the Supreme Court reversed the judgment of the U. S. Circuit Court of Appeals (*A. Y. B.*, 1914, p. 620) and held that the caffein in Coca Cola is an "added" ingredient within the meaning of the Food and Drugs Act, and that the questions whether the presence of caffein may render the article injurious to health, and whether the name "Coca Cola" is false or misleading, are questions of fact for a jury to decide.

During the year there were issued by the U. S. Department of Agriculture food-inspection decisions relating to the certification of mixtures containing coal-tar colors, gluten products and diabetic food, maple products, egg noodles and plain noodles, colors in foods, cacao products, Rocky Ford melons, the marking of the quantity of food in package form, and the use of guaranty legends and serial numbers on labels. The Department has proceeded against interstate shipments of eggs containing an undue proportion of decomposed eggs. In consequence it is necessary for ship-

pers to candle the eggs, which will result in a great conservation of the egg supply. Especial attention was paid also to the canning of decomposed beans, the watering of oysters and scallops, the adulteration of oats with weed seeds, of cottonseed meal with hulls, to the improvement of the milk supply, the adulteration of macaroni and noodles, of canned fish, of tomato products and of spices.

The first volume of the *Journal of the Association of Official Agricultural Chemists* appeared during the year as a quarterly. It contains the proceedings of the Association and the revision of the official methods of analysis. In future it will also contain reports of research on methods of food, drug, feed, fertilizer, insecticide and fungicide analysis and in agricultural chemistry.

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SANITARY CHEMISTRY

E. M. Chamot

Dietetics.—The European War has demonstrated in a most striking manner the value of sanitary chemistry in protecting human life against disease. Never before have such gigantic problems arisen of supplying with proper food and drink large bodies of men engaged in work of the most strenuous character. These problems have been not only those of safe and clean foods but food combinations supplying a suitably balanced ration. That the chemists and sanitary corps of the contending armies have solved these problems is shown by the remarkable freedom of the men in the trenches from food- and water-borne diseases, and the diseases resulting from malnutrition.

On the other hand, there is proof that attempts to curtail foods of certain classes while still maintaining a total calorific value within the usually accepted values are not safe, nor can normal health be conserved under the old system of apportioning so many calories to carbohydrates, so many to proteids, so many to fats, and so on. The work of the last few years has opened our eyes to the fact that in apportioning the various unit groups in our dietaries we must consider the selection of certain kinds of specific nutrients. A careful study of the dietaries of the prisoners in certain much criticized detention camps leads to the conclusion that not in all cases has there been a lack of sufficient foods but that the foods have been improperly selected, it being assumed that a combination giving a total calorific value corresponding to approximately 1,800 to 2,000 calories was all that was necessary. Notwithstanding this, the men and women

failed in health. We thus have good reason for rejecting the older theories of "balanced" rations and can assert that the new thought of the day, —the necessity of properly selected groups,—is essential to our well-being.

Water and Sewage.—In America the methods for the examination of water have been carefully studied and standardized. The standard methods finally proposed bid fair to be accepted by most laboratories and with a few minor changes by the Federal Bureau of Chemistry. In Europe a vast amount of research has been devoted to rapid methods for the examination of potable waters in the field; to testing small, easily portable water filters; and to the study of tablets designed to sterilize water by simply dropping them into the glass or cup of impure water. Nothing materially new has been added to our knowledge, but it has been shown that it is possible to make satisfactory tests upon considerably smaller volumes of water than those commonly used by most water analysts. In general there is a tendency for many chemists to revert to the older and saner idea that each water should be judged upon its own merits as shown by the analytical results obtained, rather than to try to judge its quality by established standards.

The agencies at work and the results accomplished in "natural" or "self-purification" of streams and reservoirs has again received considerable attention—a fruitful field for investigation long neglected. The most important of these studies by the United States Government has been published in Bulletin 104 of the U. S. Hygienic Laboratory. In general, it may be said that as a result of these investigations, added importance must be laid upon the microscopic examination of waters and bottom muds, and upon a consideration of the relation existing between the amount of oxygen in solution in the water and the amount and character of the plankton present. Studies upon the application to water purification of the flocculated- or colloidal-clay method of sewage treatment have shown that in many cases waters polluted by industrial organic wastes may thus be successfully treated. The clay after absorption of the colloidal matter may be dried and used as a fertilizer. The high cost of calcium hypochlorite has led to its replacement by liquid chlorine. But few plants now remain using the older system. Attempts to increase the efficiency of hypochlorite and thus lower costs by the introduction of ammonia have been successful in some cases while others have shown no change, from which it may be concluded that the ammonia process is still a doubtful expedient. An important contribution to the methods for the detection of minute amounts of free chlorine in treated waters has been made by French chemists, who have shown that by freezing the samples, the chlorine may be concentrated in the portions the last to congeal, and thus may easily be detected by our ordinary methods.

In America the theory, advanced a year ago, of colloidal silica in drinking water as a cause of pellagra, has so far failed of convincing proof, sanitarians believing that pellagra should be classed with beri-beri as a disease of malnutrition possibly the result of a lack of some vitamine body.

An important and far reaching decision of the Pennsylvania Supreme Court to the effect that consumers of water for domestic use cannot be "required to pay for the water used if it is unwholesome or impure" bids fair to establish a new standard in the United States.

In sewage purification the tendency is toward combination systems rather than septic or Imhoff tanks separately, and it is evident that activated sludge methods have been established upon a firm foundation and have come to stay. Moreover, it has been shown that over twice as much nitrogen is retained in the sludge, thus giving promise of valuable fertilizers being thereby obtained. (See also XI, *Public Services.*)

Foods and Drugs.—The chief advances have continued to be in the line of standardization of products and in the improvement of methods for their analysis. Long neglected substitutes for both foods and drugs, whose prices have reached almost prohibitive figures owing to war demands, continue to appear in the

market, and to receive much attention in the hope of improving their quality. As examples, may be mentioned nut milks and maté, the latter as a substitute for tea.

Under an energetic administration of pure-food laws, food adulteration has been reduced to a minimum, and the campaign for the preservation of the public health has changed from a crusade in which chemical and bacteriological analyses are the criteria for condemnation to a crusade to obtain *clean* food and the elimination of the disease "carrier" from the men and women engaged in the manufacture or handling of food stuffs.

Reports indicate that the adulteration of rare and expensive drugs is increasing to an extent to endanger the proper treatment of certain diseases.

Ventilation.—The progress of the year in ventilation has been in the perfecting of methods for the determination of minute quantities of sulphur dioxide and trioxide and in the detection of poisonous gases in the air.

AGRICULTURAL CHEMISTRY

William H. Ross

Soils.—The question of soil acidity, referred to in previous issues of the Year Book (1914, p. 624; 1915, p. 623), still continues to attract a great deal of interest and during the year perhaps more attention has been given to this subject than to any other in soil chemistry. There is perhaps no other subject of soils about which there are so many conflicting ideas and theories. According to the view now held by many, the phenomenon of soil acidity, or of the acidity of extracts prepared by shaking soils with neutral salt solutions, is due generally not to the presence originally of a free acid in the soil, although this may sometimes occur, but to the action of the soil colloids in bringing about a selective adsorption of the basic ions in solution, thereby setting free an equivalence of acid; the action of the latter in turn will cause some of the bases of the soil to pass into solution. In the case of acid soils it is held that more base is adsorbed from solution than is given back to it, and there is, therefore, free acid in proportion to the excess of anion. This view, however, is not accepted by all investigators in this field. Thus Truog (*Jour. Phys. Chem.*, xx, 457) maintains that the existence of selective adsorption of ions from the common alkali and alkaline-earth salts is questionable. It is pointed out that the phenomenon observed with these salts and designated as selective adsorption of ions is always small in extent and commensurate with chemical reactions that might be expected of impurities in the adsorbent, while the phenomenon observed in acid soils is of an entirely higher order in extent and comparable in every way with chemical reactions. It is held further that the possibilities for the formation of true acid substances in soils of the humid region are manifold, and that it would be difficult to explain why such substances should not be formed. In most upland soils acid silicates are thought to be the main cause of soil acidity, although organic acids also may be present; these acid substances may be either in the crystalloidal or colloidal condition and their acid reaction is due to their chemical nature and not to their colloidal condition.

From his experiments on soils, Rice (*ibid.*, 214) concludes that when so-called acid soils are shaken with salt solution, the quantity of bases from the soil which is given up to the solution is equivalent to that portion of the cation of the salt which is adsorbed. The greater acidity of the extracts thus obtained as compared with the salt solutions themselves is accounted for by the fact that one of the bases present is aluminium, which does not securely hold its share of the acid, but through hydrolysis there is formed hydrated aluminium oxide along with equivalent quantities of free acid. The former being slightly ionized and the latter more or less strongly ionized, the resultant solution will be quite acid.

It has been noted by Brown and Johnson (*Jour. Am. Soc. Agronomy*, vii, 216) that the apparent acidity, or lime requirement, of a soil as determined by the Veitch method, is reduced when the soil is ground and frequently becomes basic, and that the

increase in basicity is greater the greater the percentage of sand. Grinding sandy soils of New Jersey on the other hand was found to increase their acidity (Cook, *Soil Science*, i, 95).

The interest which has been taken for some time (*cf. A. Y. B.*, 1915, p. 623) in the relation of sulphur compounds to plant nutrition has apparently continued undiminished throughout the year. The main conclusions to be drawn from the numerous investigations made along this line are that sulphates have very little effect as compared with soluble phosphates on the soil flora, but that for certain plants and types of soil they may prove beneficial by simply serving as a source of sulphur; a special influence on root development in the case of certain plants, particularly red clover, was also noted. In general, calcium sulphate was found to be more effective than the more soluble sodium sulphate. The results obtained with elemental sulphur were for the most part injurious, due to its oxidation in the soil to sulphuric acid or other intermediate compounds of a toxic nature. (Hart and Tuttingham, *Jour. Agri. Research*, v, 233; Pitz, *ibid.*, 771.) (See also XVII, *Agriculture.*)

The identification by Walters (*Jour. Ind. Eng. Chem.*, vii, 860) in certain soils of proteose and peptone substances which are known to represent stages of decomposition between that of true proteins and amino acids gives support to the view that proteins when added to the soil in the form of manures or otherwise undergo decomposition in much the same way as in digestion by enzymes, acids or alkalies in the laboratory.

Fertilizers.—The high cost and scarcity of fertilizer materials which have prevailed during the year have naturally aroused renewed interest in the question of finding new sources for these materials and of devising new and improved methods of manufacture. Potash salts are now being produced from such new sources as the salt lakes of western Nebraska, alunite, and the Pacific Coast kelps. Apparently, however, it still remains to be demonstrated whether or not these will prove profitable sources of potash under normal conditions. With a view to securing more definite information along this line, Congress awarded the Bureau of Soils an appropriation of $175,000 for the purpose of making an investigation on a commercial scale of the cost of extracting potash from kelp. It is thought that the methods which offer most promise under normal conditions are those which provide for the recovery of other products in addition to potash. Thus, when kelp is subjected to destructive distillation there may be obtained ammonia, iodine and other by-products. The combustible gases evolved in this case will serve as a source of heat, and by leaching the residue, potash salts may be obtained of commercial purity which will enable cost of transportation to be reduced to a minimum.

During the year at least 20 patents have been issued in the United States on processes for the extraction of potash from feldspar and other insoluble silicates. It is now generally recognized that under normal conditions no process for obtaining potash from feldspar can prove economical unless there is obtained at the same time some other product of value in addition to the potash. That these silicates, however, may serve as a source of potash when used in the manufacture of other products has now been demonstrated in the cement and steel industries, in both of which potash is now being recovered in the flue or furnace dust collected in these plants. The source of the potash is the potash silicates occurring in the raw materials used. A portion of the potash is volatilized during the process of burning, and in several cement plants throughout the country the Cottrell process has been or is being installed for the purpose of securing a more complete recovery of the potash. (See also XVII, *Agriculture.*)

In 1915 the production of ammonia in the United States, as ammonium sulphate, was 220,000 tons, as compared with about 183,000 tons in 1914. From the by-product coke ovens now in operation, under construction and contracted for, the production for 1917 will be no less than 376,000 tons. According to Turrentine (*Jour. Ind. Eng. Chem.*, viii, 584) and others, the

by-product ammonia thus available is ample to supply the needs of the country in any emergency for some time at least. Atmospheric nitrogen compounds have been prepared in this country during the year, but all more or less in an experimental way, and none have so far entered into the fertilizer trade. The most recent development in this field of noteworthy interest has been the passage by Congress of a bill placing $20,000,000 in the hands of the President, with authority to establish a plant for the production of atmospheric nitrogen compounds for use in fertilizers as well as in the manufacture of ammunitions (see also *Industrial Chemistry, infra*).

Investigations on the extraction of phosphoric acid from phosphate rock by smelting in an electric furnace, as noted in the YEAR BOOK for 1915 (p. 624), are still being continued. Ross, Carothers and Merz (*Jour. Ind. Eng. Chem.*, viii, Jan., 1917) have made use of the Cottrell precipitator for recovering the phosphoric acid evolved from the furnace instead of the scrubbing-tower system previously used. The advantages claimed for this method of collecting the phosphoric acid are as follows: (1) the equipment required is simple in construction and automatic in operation; (2) the phosphoric acid recovered in this way is of a high degree of purity; (3) a more concentrated acid can be obtained in this way than is possible by any other commercial process, and when this acid is used in the preparation of concentrated fertilizers, such as mono-ammonium phosphate, a dry product may be prepared directly without the necessity of evaporating solutions or of drying the resultant product.

From experiments extending over 13 years Wiancke and Conner (Indiana Agri. Expt. Station, Bull. 187) have found that for the soils tested the per-acre net profit from the use of acid phosphate has been over six times as great as from rock phosphate; that the per-dollar investment profit has been over seven times as great from the former as from the latter; and that the values of the crop increase per pound of phosphorus applied in the form of these two materials have been 28⅓ and 3½ cents, respectively.

Plant Chemistry. — Investigational work in plant chemistry during the year has been in a large measure of an analytical nature, undertaken with a view to studying the changes which take place in plants or the fruit of plants during certain periods of their growth, or of the changes produced in plants or their fruit when subjected to certain treatment. Thus, by ash analyses of upland rice made at intervals during the growth of the crop Gile and Carrero (*Jour. Agri. Research*, v, 357) have found that, in common with similar studies of many other plants, the percentages of potash, phosphoric acid and sulphur in the ash, and of nitrogen in the dry matter, decreased with the age of the plant while silica increased, and further that while the iron content of the ash of the whole plant varied but little with the age of the plant, the percentage of iron in the ash of the green stem and leaves decreased markedly with the age. This would indicate that iron, like silica, is not transported or leached from the dead tissue to the same extent as the other mineral elements.

Shedd (*ibid.*, 529) has observed from analyses of the mineral constituents of the sap of the wild-grapé vine that there is a considerable variation in the composition of the sap when collected at the same time from two different points, and that there are also large variations in the composition of the sap when collected at the same point on the vine at different times during the same season. A similar result was observed also with the sap of the sugar maple. It is thought that this variation in the mineral composition of the sap later on influences the structure of the growing parts and undoubtedly explains the differences in composition of the same and different varieties of plants.

Numerous analyses by Alwood and his coworkers (U. S. Dept. Agri., Bull. 335) of different varieties of grapes during the period of ripening show in all cases an increase in sugar and a decrease in acid content from the time the fruit is colored until fully ripe. In some cases the change was quite marked. It is shown that the de-

crease in acidity is primarily due to the influx into the developing fruit of potassium, and to a slight extent of other bases, which combine with the tartaric acid to form insoluble salts. The content of malic acid, which is also present, may be reduced in a corresponding way after the disappearance of all free tartaric acid and also by oxidation through respiratory processes during the development of the fruit.

Headden (*Jour. Agri. Research*, v, 349) has found that manganese is present in wheat wherever grown, irrespective of the conditions of soil or climate, and is present in the wheat kernel in about the same proportion as iron, although the latter greatly predominates in the soil. Fertilizers applied to the soil did not affect the amount of manganese stored in the kernels. The regularity with which manganese was found in wheat indicates that it may possibly be an essential mineral constituent of this as well as of other plants. (See also *Biological Chemistry, supra.*)

Dairying.—The principal changes which take place in milk as a result of ordinary souring are enumerated by Van Slyke and Bosworth (N. Y. State Agri. Expt. Station, Tech. Bull. 48) as follows: About 22 per cent. of the milk sugar is changed by the lactic-acid bacteria, 88.5 per cent. of the amount so changed being converted into lactic acid; citric acid completely disappears, being decomposed into acetic acid and carbon dioxide; the insoluble inorganic constituents of the fresh milk are made soluble by the lactic acid; and calcium caseinate is changed into calcium lactate with precipitation of the casein. (See also XVII, *Dairying.*)

ELECTROCHEMISTRY

G. A. Roush

The Electrochemical Industry.—The year has been one of enormous progress along electrochemical lines. Prices have been high for all sorts of materials, and heavy demand has taxed production to the limit. The flurries caused by the first rush of heavy demand have passed away and things have now settled down to systematic heavy production, which is still unable to keep abreast of the demand. The disorganization caused by the disappearance from the markets of many necessary materials of foreign origin has been almost entirely remedied by the domestic manufacture of the same materials or by the development of substitutes.

At the recent second National Exposition of Chemical Industries, held in New York City, electrochemistry and electrochemical products played a prominent part. Another indication of the growing importance of electrochemistry is the unusual increase in members in the American Electrochemical Society. During the first nine months of 1916 about 250 applications for membership were received, —this being about double the usual number for the full year.

"Niagara Falls Power and American Industries" was the subject of a symposium at the spring meeting of the American Electrochemical Society (*Trans. Amer. Electrochem. Soc.*, xxix). The topics covered were "Power Development," by I. R. Edmands; "Electric-Furnace Products," by F. J. Tone; "Chemical Industries," by A. H. Hooker; and "The Nitrogen Industry," by W. S. Landis.

Electrometallurgy of Tin.—During the year two more metals have been added to the list of those produced electrolytically, tin and zinc. In the case of tin the metal is produced in a crude form and electrolytically refined, while zinc is obtained electrolytically as pure metal directly from the ore. Bolivian tin concentrates are roasted in a muffle furnace with limestone and coke, and the crude metal cast into anodes. These anodes are then refined electrolytically, using an electrolyte containing 15 per cent. of hydrofluosilicic acid and 4 per cent. tin, in wooden tanks lined with an asphaltic coating. The cathodes are sheet tin about one-eighth of an inch thick, and a current density of about 12 amp. per square foot is used. The tin averages 99.96 to 99.98 per cent. pure. (R. H. Vail, *Eng. Min. Jour.*, ci, 927.)

Electrometallurgy of Zinc.—Of the many recent advances in electrochemistry, one of the most striking is the production of electrolytic zinc. Work has been progressing along this line

in several localities for a number of years, and it needed only the assistance of the high prices for pure zinc for munitions manufacture to enable these developments to be brought to a producing stage. With zinc at seven cents a pound, it would have required a long time to perfect the experimental work to where metal could be produced at a profit, but with spelter at five times its normal price and with a comfortable bonus on top of that for high-purity metal, the producers were able to run their plants on a commercial scale with a good margin of profit where they would have had to carry a big margin between selling price and production cost in normal times. Spelter has now returned to almost its normal price, but with the experience gained in the period of high prices, most of the producers have probably been able to reduce their manufacturing costs to a point where they will still be able to remain in the market. (See also XVIII, *Zinc.*)

Several operations are under way for the production of electrolytic zinc, the most pretentious of which is that of the Anaconda Copper Co. at Great Falls, Mont. A plant is at present under construction for the production of 100 tons of pure zinc per day. The process is as follows. The ore is concentrated by flotation and the concentrate is roasted at a temperature not exceeding 1,350° F., so as to produce a calcine containing two-thirds of one per cent. sulphur. This calcine is then treated with dilute sulphuric acid (spent electrolyte plus fresh acid) and the dissolved iron is oxidized by the addition of manganese dioxide, the manganese then being precipitated by the addition of limestone. Antimony and arsenic present as impurities are carried out with the iron, and copper and cadmium are removed by treatment with zinc dust. The solution is then electrolyzed, depositing the zinc on aluminium cathodes with a current density of 20-30 amp. per square foot. The anodes are lead plates. The cathode deposit is stripped off every 48 hours for melting. The spent electrolyte is used for the leaching of more ore, sufficient fresh acid being added to make up for losses in the process.

The work on electrolytic zinc has been extended to the production of electrolytic zinc dust (Morgan and Ralston. *Trans. Amer. Electrochem. Soc.*, xxx). With sodium zincate as an electrolyte, a zinc sponge can be obtained, which on drying gives a finely powdered metal.

Electrometallurgy of Lead.—Some work has been done also toward the development of a direct leaching and electrolytic deposition process for lead (Sims and Ralston, *ibid.*). The ore is leached with a saturated salt solution, dissolving the lead; the solution is then filtered and subjected to electrolysis to recover the lead. The salt solution coming from the filter runs 1.0 to 1.5 per cent. lead, and this can be removed by electrolysis down to 0.1 per cent. The current density is varied from 60 amp. per square foot at the beginning of the run to 20 amp. at the end, the corresponding voltages being 1.0 and 0.5 volts.

Electrometallurgy of Iron.—In Bulletin 344 of the Mines Branch of the Canadian Department of Mines, Stansfield gives an extended report on "Electrothermic Smelting of Iron Ores in Sweden." Detailed descriptions of various Swedish works are given with figures for the consumption of electric energy, fuel, fluxes, and electrodes, and cost of plant and upkeep. There is no evidence given to show that the electric smelting of iron could be undertaken on a large scale in competition with the existing blast-furnace industry of Canada. The cost of producing electric pig iron in Canada is estimated at from $18.50 to $21.00 per metric ton.

Magnesium.—One of the smaller electrochemical industries that has received enormous impetus due to demands for war supplies is the manufacture of metallic magnesium. Large quantities of metal are now being made, with possibilities for further increase (W. M. Grosvenor, *Trans. Amer. Electrochem. Soc.*, xxix).

Electric Furnaces.—Electric furnace work, particularly along iron and steel lines, has been especially stimulated by the growing demand for products, and a large number of new furnaces have been or are being installed. The usual discussion still continues in regard to the adaptability of the vari-

ous types of furnace, and of the value of the electric-furnace process as compared with other standard processes. An interesting discussion along this line was presented in a paper by W. M. McKnight on the "Faults of Small Electric Arc Furnaces" (*ibid.*, xxix). (See also XXI, *Electrical Engineering.*)

Duriron Anodes.—Previous to the outbreak of the war, the Chile Exploration Co. was using in its copper leaching plant at Chuquicamata, Chile, anodes of fused magnetite from Germany. When these could no longer be obtained, a substitute was found in the corrosion-resistant alloy known as "duriron." These anodes are not entirely free from corrosion, but 15 to 20 times their weight of copper can be deposited before they are eaten away. Duriron has an advantage over magnetite in mechanical strength, but it has a higher overvoltage and requires about 15 per cent. more electrical energy to deposit the same amount of copper, necessitating additional cooling of the electrolyte. (C. A. Rose, *Eng. Min. Jour.*, ci, 321).

Electroplating.—The fact that cobalt can be plated at current densities up to 150 amp. per square foot indicated the possibility of obtaining similar results with nickel. According to Watts (*Trans. Amer. Electrochem. Soc.*, xxix), the difficulty with nickel is the tendency of the anode to become passive, causing the production of acid and liberation of hydrogen at the cathode. The addition of a chloride to the bath and operating hot overcomes this trouble and makes it possible to operate at 200-300 amp. per square foot, getting a satisfactory deposit in five minutes instead of from half an hour to an hour. Further work has been done on the subject of nickel plating by Mathers, Stuart and Sturdevant (*ibid.*, xxix), and by Hammond (*ibid.*, xxx).

At one of the recent meetings of the American Electrochemical Society, Hogaboom (*ibid.*, xxix) presented a paper on "Some Unsolved Problems of the Electroplater," which brought out a considerable amount of interesting discussion in regard to the possibilities of solving these difficulties.

The application of addition agents in the field of electrodeposition has been still further extended, to include the deposition of silver from silver nitrate solutions (Mathers and Knebler, *ibid.*, xxix). By the combined use of tartaric acid and glue, smooth heavy deposits of silver can be obtained.

High Temperatures by Electrolysis.—Hering (*ibid.*, xxx) calls attention to the possibility of developing high temperatures by electrolysis. When the current density on a cathode in certain aqueous electrolytes is increased sufficiently, the cathode becomes red hot. The electrolyte must be one which will develop a free gas at the cathode. The impressed voltage must be high enough to force the current through this gas film, 65 to 115 volts. Current densities vary from 3.5 to 10 amp. per square centimetre (3250-9300 amp. per square foot). A surface can be heated in this way more rapidly than by means of a flame, and it may be possible to heat a surface to a high temperature so quickly that the heat would not penetrate to the interior until after the object of the heating has been accomplished. It may also be possible to use this as a means of quenching steel that is to be hardened only on the surface.

INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING

James R. Withrow

Noteworthy Tendencies.—Progress in industrial chemistry and chemical engineering during the year has been largely dominated by war conditions. Unusual demands for chemicals continued from abroad in addition to war drains and healthy home requirements. These demands, together with speculation, raised prices to unusual levels and rendered some situations acute. This resulted in expansion of existing plants, rapid installation of new ones, hasty perfecting of new processes already slowly maturing, and the seizing of opportunities to profit by high prices through erection of small plants for the production of special chemical materials and through the development of processes hitherto existing only as possibilities in the minds of chemists. This has greatly extended also those auxiliary

engineering and chemical operations which supply chemical construction materials and machinery. It has increased the opportunities for the rapid development of inventions in machinery and materials. The progress made during the year in this line alone has been as great as has been accomplished in many decade periods in the past. The importance of this is apparent when we consider that if the chemical engineer had at his disposal in his plant as efficient apparatus and materials of construction as exist in the chemical laboratories of the present day, progress in the arts would be at least a hundred years ahead of its present development.

Manufacture at the Market.—Beside those mentioned, there is a growing tendency for manufacturers who are large consumers of chemicals to produce these chemicals themselves. Assisted by gradual price elevation, this tendency has been greatly encouraged by the invention and development in the last decade of processes and machines of merit which could find no sale as such in well established chemical manufacturing plants because they frequently offered advantages insufficient to warrant discarding those already operating or were merely alternative in their character. Not a few chemical manufacturers and brokers whose greed has caused them to demand prices for their product much beyond those warranted by increased cost have succeeded in destroying a large share of their market by driving the consumer into the business of making his own chemicals or into combination with other consumers for this purpose, as a matter of self preservation.

A good example of how this tendency to manufacture at the market works out normally where the impelling force is merely gradually advancing prices, competition preventing excessive elevation, is to be seen among others in the case of bleach for paper manufacturing. Progressive paper manufacturers, operating on a large scale, and other consumers of alkali and bleach have experimented with inventions for the electrolytic production of these materials from common salt, and our present high development in this branch of chemical industry is due in no small degree to these individual efforts, many of which during the past 20 years of experimentation have been eminently successful. High prices and poor deliveries in the last two years have forced matters to a head in this direction. Where formerly we had a few large chemical plants manufacturing caustic soda and chlorine for bleach by electrochemical means, we now have distributed throughout the country a great number of concerns which have added to their equipment plants for the production of these products. The operation of these units under widely diverse conditions will greatly enrich our chemical-engineering experience. The list of such consumers making their own bleach was sufficiently large before the war to demonstrate the economy and practicability of this auxiliary business in most cases in which 1,500 or more tons of bleach were consumed a year. The electrolytic cell has become a reliable and stable instrument in the hands of trained employees. A number of cell types are obtainable which operate economically. Some of these are well advertised in the current literature, but some equally successful, such as the Allen-Moore, Gibbs, and Nelson cells, are not so well known. The cell portion of such a plant, however, is only a fraction of the equipment required, and it is important that the rest of the plant should be properly designed. This other portion of the plant involves apparatus for the absorption of the chlorine gas (produced directly by the cells) in milk of lime or caustic alkali solution for the production of the desired hypochlorites, which are the usual bleaching agents, and for the proper handling of the caustic soda also produced directly in the cells. The production cost of bleach in any plant, therefore, depends not only upon the electrolytic-cell operation but also upon the expense necessary for finishing the chlorine and caustic soda for use or market. The simpler and more durable the design of apparatus, therefore, the more satisfactory the entire equipment will be. There have been placed in operation recently over 1,200 cells of one type alone, with a daily capacity of 120,000 lb. of chlorine gas. This cell has

been used in more than eight plants constructed during the year, some plants costing as much as a half million dollars.

Manufacture at the Source of Raw Material of Greatest Volume.—In addition to the tendency to manufacture at the market there has come in recent years what appears a diametrically opposite tendency, that is, to manufacture at the source of raw materials. This has been considerably accentuated since present war conditions have obtained, perhaps because of increased transportation difficulties. It is sometimes stated, with reasonable accuracy, that the finished products in the chemical business are about one-fifth the volume of the raw materials consumed. A large portion of this raw material is the fuel necessary for plant operation. There has come about a gradual tendency, therefore, to move chemical plants from the eastern seaboard to the "mine mouth" and the chemical industries (which are always greatly influenced by transportation) are being gradually linked up with sources of fuel, except in those cases where some other raw material, such as brine, demands that the operation be conducted at that particular source of raw material. In this latter case, plant situation where both fuel and brine exist together in nature is highly desirable. In the older chemical industries much of the raw material was imported and even fuel (wood) could be transported by water; hence plants clung to the sea-board. This had the added advantage of being at the market also. The source of raw materials, particularly fuel, receded in time from the coast; hence the tendency now to migrate to the source of raw material of greatest volume, and consequently to divide the industry with other manufacturers, so that those manufacturing chemicals solely tend to move to the source of raw materials and those portions of the industry which progress best at the markets are being taken over, where possible, by consuming manufacturers. The tendency of the soda-ash and salt plants of the country to seek brine near cheap fuel is well known, and new dye and other industries are seeking the Appalachian coal sections.

Chemical Engineering and Preparedness.—It has become common knowledge that chemical engineering plays a vital *rôle* in modern warfare. Explosives and asphyxiating gas manufacture are dependent upon labyrinthian chemical-engineering operations. It is obviously necessary for adequate preparedness that this country should be self-contained and not dependent upon importation for such supplies as nitric acid, toluol and sulphuric acid for defense. We have the sulphur for sulphuric acid on the Texas and Louisiana coast. This demands adequate military protection, as small invading forces at these points could cripple most of our munitions industry, our other sources of sulphur are so inadequate. We import pyrites for this purpose from Spain even for Middle West sulphuric-acid plants. Of toluol we have ample for our usual needs, but in time of war it becomes the basis of trinitrotoluol ("T.N.T."), one of the most effective military explosives. The erection of new coke-oven plants has but partially met the demand for toluol in the last two years. In defending ourselves this would be too slow, for such installations are difficult to get under successful operation in less than a year. A large and well established dye industry, therefore, is vital for defense, for it would produce a bigger demand for coal-tar products and toluol production, and its operations are quickly convertible into processes for producing high explosives. The expense of storing within the country nitrate of soda, imported from Chile, adequate for the nitric acid of munitions production in case of war would tie up millions. The Government is considering the establishment of a plant to make nitric acid from atmospheric nitrogen. The Norwegian process (electric arc) is stated to require five times as much power, a vital factor, as is required in the making of nitric acid from cyanamide. Germany has installed for making cyanamide, during the war, additional equipment costing $100,000,000, utilizing over 600,000 h. p. and producing about 200,000 tons per year of nitric acid, requiring the most feverish activity for a year and a half on the part of her chemical engineers. Any method for making nitric acid

which produces ammonia also is desirable as an aid to agriculture. Prices asked for power, however, are much higher than abroad, and as the cost of the engineering is only about 10 per cent. of the total charges in electric-power installation, it becomes evident that efficient national defense and economic agriculture depend on more economic banking methods. So in every instance we are confronted with the problems of peace when working out national defense. It should be remembered that our usual source of nitrogen derivatives, the ammonia of by-product coke, brings with it the indispensable toluol, and no electrical method does this. Before the Government nitrogen plant is built, therefore, it should be a matter of serious inquiry whether the $20,000,000 might not bring the same result and give a liberal supply of toluol besides, if invested in by-product coke expansion, for much of our coke is still made without saving by-products. (See also *Agricultural Chemistry, supra.*)

It is an open secret that the acceptance of war orders in this country strained to the breaking point our best organized chemical industries, and that even yet many concerns are unable to produce more than 20 per cent. of their contracts. The mere request by the allied countries a year ago for our soda, benzol, toluol and our explosives for only a *small portion* of their needs has produced a state of affairs in our industries that is an appalling warning against the time when we might need such things ourselves for defense, and in immensely greater volume.

It is natural, in view of the nature of these defense problems, that the engineers and chemists of the country are serious in the preparedness movement. Thirty thousand engineers and chemists of the United States volunteered without pay to the National Consulting Board for both the Navy and Army to work on the organization of the industries of the country for national defense. The result will be much more efficient than any similar organization in the world, for no government could afford to pay for the expert services involved. It is to be regretted that it does not seem possible to interest the Washington Government in including the American Institute of Chemical Engineers in the Board, though they are preëminently desirable and many of them are voluntarily working for the Board. This Consulting Board can assist the country to become self-contained for defense, arrange for speedy conversion of industrial plants into munitions plants, and arrange during peace to prevent useless waste of experienced engineers. Experienced chemical engineers, for instance, like naval officers, cannot be trained in a day or a year, though the analytical chemical control can be taught in a few days. The mistakes made by Great Britain in passing through the blockade materials helpful in explosives manufacture demand that our military and diplomatic authorities have at their call as wide a variety of chemical experience and advice as possible.

Acid-Resisting Alloys.—High-pressure manufacturing of chemicals and the difficulty of obtaining supplies have brought about rapid improvement and development of chemical-engineering materials by compelling large scale experimentation on new products and substitutes. To resist corrosion by acid and other chemicals, pottery, or so-called chemical stoneware, glass and natural stone apparatus have been used heretofore. This necessitated small-sized apparatus, and meant in the case of stoneware a manufacturing time of about two months for the clay working, drying and cooling after firing. Attempts have been made for many years to replace this material by metal. Platinum, silver and gold are used in special cases, but while these metals can be made into apparatus of any size, cost is prohibitive for most uses. Two classes of alloys have now been developed, rare-metal alloys, such as tungsten, chromium, or nickel irons, and more recently the cheaper silicon-iron alloys. Silicon is very similar to graphite and is the basic element of the silicate industries and quartz or silica ware. Extensive trials in the last two years have shown the usefulness of these alloys, though they do not possess quite the resistance of stoneware to corrosion. They are known under varying trade names, such as duriron, tantiron, and ironac.

They are very resistant to all strengths of sulphuric and nitric acids and are used with great satisfaction in their manufacture and permit plants to run for months without shut-down. The success of the modern tower system displacing platinum for concentrating sulphuric acid has been largely due to the use of pipes and fittings of this alloy. Early in 1915 the demand for nitric acid for war purposes increased to enormous proportions, resulting in extensions to old nitric-acid plants and the erection of new ones. Deliveries on stoneware jumped to six months and even longer, and had the production of nitric acid been dependent upon stoneware alone, as a few years ago, it would have been greatly curtailed and the story of the great war might have been different. As these alloys can be secured on short notice as easily as cast iron, chemical manufacturers do not hesitate, if a still should run wild and froth sodium sulphate into the condenser, to direct workmen to break the connections at once with a hammer and allow the expelled material to flow on the floor, thus preventing the wrecking of the condensing apparatus. New castings can replace the broken one at once, but such extravagant handling of the material would not be possible under the usual slow deliveries with stoneware. The alloy is somewhat brittle, but very much less so than chemical stoneware, and it cannot be readily machined. Some apparatus, such as centrifugal pumps, are still not designed with sufficient attention to this brittleness, particularly in the glands and stuffing boxes. These silicon-iron alloys are a boon to the acid industries; thousands of tons of castings are in use and new chemical processes are possible which could not exist before because of lack of suitable material of which to construct apparatus.

Miscellaneous Progress.—A number of dye concerns are making good headway in dye manufacture, though serious efforts are being made by German dye distributors in this country to prevent any knowledge of American markets in possession of the Government from reaching American dye manufacturers by delaying publication of certain dye statistics gathered by the Department of Commerce and Labor. Congress incorporated in the General Revenue Act a provision against dumping of dyestuffs after the war which is worthless for the protection of the American manufacturer. Not only does the Act specify exemptions which apply to between 80 and 90 per cent. of all dyestuffs imported, but it places the burden of proof of dumping on the victim.

It is disappointing to note the abandonment of the manufacture of toluol from petroleum by the cracking operations developed by the Bureau of Mines. Since toluol is so important for defense, it seems a pity that the Government did not give the process more mature study and less advertisement. Investors at least would thereby have been protected against much pecuniary loss.

Ammonia of high purity is now being produced in this country from atmospheric nitrogen through the cyanamide route, heated calcium carbide being treated with nitrogen to form calcium cyanamide and this being treated with steam to form ammonia. This is destined to be a factor of importance in agriculture and national defense. The great deposits of highly cellular infusorial earth in California are being developed and this material is being enterprisingly introduced, particularly into heat insulation and filtration operations, with great advantage to chemical engineering. Great activity continues in the development of American-made chemical glassware and porcelain, as well as devices made necessary by the sudden expansion of the chemical industries of the country. The second National Exposition of Chemical Industries held in New York City was a good index of this growth. Radical chemical-engineering innovations have given us a new alum-making process and others are condensing nitric acid at the rate of 1,000 lb. per hour in a single condenser. Quartzware in unheard-of sizes is in use, and new processes for making cyanides, acetone and antimony have been introduced.

The Perkin Medal award for 1916, to Leo H. Baekeland, was a happy one. He has placed America to the fore in more than one field.

Bibliography.—Among the important non-technical papers of the year may be noted: "The Relations between the Universities and the Industries" (*Jour. of Ind. and Eng. Chem.*, 1916, 59); "The Naval Consulting Board of the United States from the Chemical Engineer's Viewpoint" (*ibid.*, 67); "Congressional Juggling with Dyestuff Protection and National Defense" (*ibid.*, 877 and 950); "Electro-chemical War Supplies" (*Met. and Chem. Eng.*, 1916, 259); "Industrial Chemical Progress and Opportunities of the South" (*Manufacturer's Record*, Sept. 14, 1916).

PHYSICS

C. E. Mendenhall

General.—The most startling item of general interest is the result reported by Shaw (*Trans. Roy. Soc.*, May, 1916) of an extended investigation of the possible influence of temperature on the Newtonian constant of gravitation. Shaw apparently finds a change in this "constant" of one part in 500 for a temperature change of 200° C. The essential difference between this and previous experiments which might have brought to light the same phenomenon, is that in Shaw's work *both* the large and the small attracting masses were raised in temperature. This very fact makes it seem *a priori* improbable that a real change in the gravitational constant has been observed, and the matter must receive further experimental check before it can be accepted. It has been the subject of interesting discussion in *Nature* (June and July, 1916) and if true is of fundamental and widespread importance. The theory of relativity continues to receive considerable attention, notably by its founder, Einstein, in a general summarizing article (*Ann. d. Phys.*, May, 1916), and by Ishiwara (*Tohoku Univ. Sci. Reps.*) especially as applied to general gravitational theory. The quantum hypothesis receives a more generous share of attention in various papers by Planck, Ishiwara, Wereide, Wolfke, and others, both with a view to extending its application and in the effort to harmonize it more closely with classical, mechanical and electrical theory. Tolman's principle of similitude has been the subject of very vigorous discussion by J. Ishiwara (*Tohoku Univ. Sci. Reps.*), and more especially by Bridgman and (Mrs.) T. Ehrenfest Afanassjewa (*Phys. Rev.*, October, 1915, and July, 1916). While the question is proving an elusive one and difficult to settle, the feeling is gaining ground that the "principle" contains after all nothing that could not be deduced from the theorem of dimensional homogeneity.

The problem of glacial flow has received very extensive experimental study at the hands of von Engeln (*Am. Jour. Sci.*, Nov., 1915) which indicates that ice can yield and flow under pressure without pressure melting and regelation. Bridgman (*Phys. Rev.*, Feb., 1916) has attacked the same general problem for a number of metals, and has concluded that while a type of plasticity or flow is produced under certain conditions by local melting (or other change of phase) and regelation of crystals, this agency does not seem to be largely effective in most practical cases of flow.

The long mooted question as to the influence of anomalous dispersion in the sun is still the subject of much discussion, especially in connection with the very slight discrepancies between the solar and terrestrial measurements of wave length of close lines, usually referred to as the "repulsion" of close spectral lines. The matter is still unsettled, but attention may be called to papers by Albrech (*Observatory*, July, 1916), Larmor (*ibid.*, Feb., 1916), Bilham (*Astrophys. Jour.*, Dec., 1915), and Evershed (*Observatory*, Jan., 1916). Wood's interesting monochromatic photographs of Jupiter and Saturn (*Astrophys. Jour.*, May, 1916) will undoubtedly lead to a considerable increase in knowledge of planetary composition. An extended comparison by Bauer (*Terrest. Mag.*, Dec., 1915) of solar-radiation data and terrestrial magnetic observations seems to show an appreciable connection

between the two, but Swann's application (*ibid.*, March, 1916) of available ionization data to determine the electrical conductivity of the upper atmosphere gives results very much less than is demanded by Schuster's theory of the diurnal variation of the earth's magnetism.

Heat.—As usual a number of important papers have appeared from the cryogenic laboratory of Onnes at Leiden, of which may be mentioned a study of the specific heat of solid and liquid nitrogen at temperatures from 14° K. to 90° K. These agree with similar results of Eucken (*Verh. Deut. Phys. Ges.*, Jan., 1916) and show a sudden increase in the specific heat at the triple point and a rapid fall with temperature below 61° K., and indicate a diatomic molecule for solid nitrogen. A preliminary report on neon gives 40° to 45° K. as an estimate of the critical temperature, and 26° K. as the boiling point at one atmosphere pressure. Further work with helium gives 5.2° K. as its critical temperature, and indicates that its vapor pressure as a function of temperature is not well represented by any of the well known formulae so far used for this purpose. Results on the important matter of the variation of the specific heat of water with temperature have been published by both the Bureau of Standards (Dickinson) and the Reichsanstalt (Jaeger and Steinwehr) who are in good agreement as to the location of the minimum at about 32° C.

The problem of the ignition of gases by electric discharge has been extensively reported on by Thornton (*Proc. Roy. Soc.*, May, 1916) and others, who, besides results of practical interest, give support to the view that the ionization of oxygen is the first step in ignition. Knudsen (*Ann. d. Phys.*, Feb., 1916) has given a very pretty experimental verification of his cosine law of molecular reflection as applied to the reflection of mercury molecules from a mercury surface. Langmuir discusses at length (*Phys. Rev.*, Aug., 1916) the same general problem of the evaporation, condensation and reflection of molecules from solid and liquid surfaces, and reaches conclusions apparently at variance with some of those of Wood (*Philos. Mag.*, Oct., 1916). Langmuir, studying largely the impact of molecules sent off from metals at a high temperature, concludes from a variety of evidence, direct or indirect, that the reflectivity of surfaces of metals or glass for the same or different molecules is in general very small, condensation usually occurring at the first impact. Wood, using cadmium and iodine molecules at ordinary or moderate temperatures, concludes that the reflectivity of glass is very high until the temperature of the glass falls below a certain critical value, different for each metal, but that the reflectivity of a metal for molecules of the same kind is very low at ordinary (or lower) temperatures. This last is in agreement with Langmuir. Both methods of attack promise further very interesting results.

The publication of the high temperature scale adopted by the Reichsanstalt (*Ann. d. Phys.*, Feb., 1916) is interesting as calling attention to the discrepancy between their accepted value of 1,557° C. for the melting point of palladium, and the Day and Sosman value of 1,549° C. accepted in this country. This implies an even greater degree of uncertainty in the region of still higher temperatures.

Radiation.—In spite of continued study of the properties of a perfect radiator, the values of C_2 and σ are still subject to considerable uncertainty. Warburg and Müller (*Ann. d. Phys.*, Oct., 1915) obtain values for C_2 all below 14,300, and Coblentz (*Bull. Bur. St.*, 1916) obtains a value 5.75 x 10-12 for σ, which is only about one per cent. different from the mean of a number of previous results. Page (*Phys. Rev.*, Feb., 1916) and Green (*Philos. Mag.*, Aug., 1916) have attacked the theory of Planck's radiation law from a modified quantum viewpoint, and Duane (*Phys. Rev.*, Jan., 1916) has discussed the same problem by generalizing the empirical formulae connecting the frequency and energy of X-rays and the velocity of the producing electron. The emissive properties of tungsten have been very thoroughly studied by Worthing (*Jour. Franklin Inst.*, March, 1916), who finds the visible emissive power to increase linearly

with the temperature, while the total radiation of tantalum has been studied theoretically and experimentally by Peczalski (*Comptes Rendus*, Feb., 1916), who considers that it obeys a law similar to Stefan's, but with an exponent 4.2 instead of 4. The reflecting power of several metals at ordinary temperatures has been measured by Wilsey (*Phys. Rev.*, Oct., 1916) simultaneously by the photometric and polarimetric methods, which are found to check to one per cent., with no systematic differences.

Nicholson and Merton (*Phil. Trans.*, June, 1916), as a result of a careful study of the broadening of the series lines of H and He, favor Stark's view that broadening is closely related to the Stark-Lo Surdo effect, as suggested by Stark. Sonaglia (*Nuovo Cim.*, April, 1916) offers further confirmation of Lo Surdo's law connecting the number of components produced by an electric field with the index of the line in its series. Stark (*Ann. d. Phys.*, May, 1916) has been attempting to get at the duration of emission of series lines, and derives an order of magnitude from 2 to 6 x 10^{-7} sec., increasing with the series number of the line. W. Wien (*ibid.*), searching for a predicted broadening or splitting of series lines due to the *motion* of the canal ray carriers in a magnetic field, concluded that certain hydrogen lines verify the prediction.

Nagaoka (*Proc. Math. Phys. Soc.*, Tokyo) gives data on the structure of the mercury lines (none of them has more than five components), and summarizes the possibilities of various combinations of crossed interference spectroscopes. The latter, however, are now exceeded in resolving power by Michelson's new gratings (*Jour. Franklin Inst.*, June, 1916). In a very interesting theoretical article Silberstein (*Philos. Mag.*, Sept., 1916) discusses the magneto-optic properties of iodine vapor. By making suitable hypotheses as to the constraints of the electron he is able to account for the fluorescent spectrum observed by Wood and Rebaud and for the extinguishing of fluorescence by a magnetic field, and to make certain predictions, experimental test of which will be of great interest.

The very interesting work started by Franck and Hertz has been extended by McLennan (*Proc. Roy. Soc.*, March, 1916)in his study of the conditions governing the production of the single- or many-lined spectra of magnesium, zinc and cadmium. He finds that these metals give spectra containing but one line when the exciting electrons have velocities corresponding to a potential fall of from 4 to about 14 volts, the exact range being different for each metal. The lines are corresponding members of corresponding series in these cases as well as with mercury. Higher-velocity electrons produce many-lined spectra. While in some points this work and that of Richardson and Bazzoni (*Philos. Mag.*, Oct., 1916) and Goucher (*Phys. Rev.*, Nov., 1916) confirms the conclusions of Franck and Hertz, there is still much to be cleared up as to the nature of the ionization produced at the lower and higher velocities, and the exact relation of this to light emission. Work of Hebb, presented to the Physical Society in December, 1916, indicates that the many lined spectrum of mercury may be produced with voltages much lower than the limit of 10 v. assigned by Franck and Hertz and McLennan.

Further extension is to be noted in knowledge of the extreme ultra-violet, Lyman (*Astrophys. Jour.*, March, 1916) having published results of wave-length measurements to 599 Angstrom units, 27 new lines having been observed. Wood and Fortrat (*ibid.*, Jan., 1916) have measured 10 more lines of the principal series of sodium, making 58 new known.

Photo-Electricity.—The most important articles in this field are Millikan's (*Phys. Rev.*, Jan. and March, 1916), embodying most accurate and extensive data connecting maximum electron velocities with the frequency of the exciting light (Einstein's equation) and the value of Planck's h (6.57 x 10^{-27}) determined therefrom. Hennings and Kadesch, using half a dozen common metals, confirm Millikan's contention that there is a maximum energy of emitted electrons with a given frequency of incident light. They find further that this maximum, as measured by the positive poten-

tials assumed by the metals, is almost exactly the same for all the metals studied if the metal surfaces are scraped *in vacuo*. Hughes (*Philos. Mag.*, Feb., 1916) has measured the velocity of the normal and selective electrons, and finds little difference between them, indicating that the two effects are not fundamentally different. Piersol (*Phys. Rev.*, Sept., 1916) has examined the effect of heating *in vacuo* on the photo-electric properties of platinum, palladium and other metals, and has developed some unexpected points. Robinson (*Philos. Mag.*, Oct., 1916) continues his work with the photo-electric discharge from very thin platinum films, and proves the existence of a very pronounced maximum current per unit *absorbed* light for a particular thickness of film of about 10^{-7} cm. The existence of this maximum cannot be considered as due to the maximum of absorption discovered by Partzsch and Hallwachs.

Electricity.—Skinner's recent theory of the glow discharge has been subjected to extensive experimental test in recent work by Cheney and by Neuswanger (*Phys. Rev.*, Feb., 1916) and the general results of the theory satisfactorily confirmed. A new method of measuring ionic mobility has been developed by Ratner (*Philos. Mag.*, Nov. 1916) and the results obtained with it which are not in accordance with Wellische's recent theory as to the nature of negative ions.

An extensive study of arcs between high melting-point metal electrodes, especially tungsten, by Makay and Ferguson (*Jour. Franklin Inst.*, Feb., 1916), leads to the conclusion that the (slight) vaporization of the electrodes plays no essential part in the electrical conduction. There are reasons for extending this conclusion to the carbon arc, but Duffield (*Proc. Roy. Soc.*, Dec., 1915) comes to the opposite conclusion, that for very short arcs the vaporization is directly determined by the current and the ionic charge of carbon.

Ionization by collision is the subject of several theoretical papers by K. T. Compton (*Phys. Rev.*, April and May, 1916), while Dempster (*Philos. Mag.*, May, 1916) concludes as the result of experiments with hydrogen that electrons of velocity corresponding to 800-volts drop can produce singly charged molecules, but that impact by these molecular ions is necessary to dissociate the H and produce Thomson's H_3 molecule. Further studies of thermonic discharge have been made by Lester (*ibid.*, March, 1916) and Stoekle (*Phys. Rev.*, Nov., 1916) which throw more light on the tremendous influence of surface conditions. Tolman and Stewart have obtained direct experimental evidence of the production of an electromotive force by the acceleration of metals, a minute effect requiring the most refined manipulation for its detection. A popular discussion of the modern theories of the electrical properties of metals is given by Sir J. J. Thomson in his usual fascinating style in several papers republished in the *Scientific American Supplement* (April and May, 1916). Data on some of these same complicated electrical properties are given by Wald (*Phys. Rev.*, Feb., 1916) and Smith (*ibid.*, Oct., 1916).

Magnetism.—No very striking development in this field is to be recorded, but it is evident that investigators are finding it difficult to reconcile the Weiss magneton theory of magnetism with experimental results. This is especially the case with the thermo-magnetic data of Honda and Ishiwara, and is in evidence also in the study of the magneto-chemistry of copper salts by Cabrera.

X-Rays.—The use of X-rays for crystal analysis according to the method of Bragg is steadily increasing, important work having been done by Vegard (*Philos. Mag.*, Nov., 1916), who, in a study of xenotime and anatase, has reached fairly definite conclusions as to the relation of the oxygen atoms to the metal atoms in the molecule. Ogg and Hopwood have used the method to decide sharply against the proposed crystallographic law of "valency volumes." Bragg (*Chem. Soc. Trans.*, March, 1916) has summarized the results obtained by applying X-ray methods to crystal study, and Debye and Shoner (*Phys. Zeit.*, July, 1916) have made a first attempt to obtain information

on the position of the electrons in the atoms by reflecting X-rays from cylinders of amorphous substances.

Our knowledge of X-ray spectra, that is, the wave length of X-rays produced from the elements when bombarded by cathode rays, is being continually extended, notably in a series of papers by Siegbahn and his coworkers (*Phil. Mag.* and *Phys. Zeit.*). New lines are being discovered, and by using a vacuum spectrometer Siegbahn has measured longer wave lengths (12.3 A. u.) than any heretofore noted, except, of course, by Sir J. J. Thomson, using his special methods for obtaining soft (or long wave-length) X-rays. A summary of Thomson's work is given in *Engineering* (April, 1916). The Mosely linear relation between atomic number of the source-element and the square root of frequency of X-rays produced turns out to be not generally linear.

The absorption coefficient of soft X-rays has been investigated by Miller (*Phys. Rev.*, Oct., 1916), and Barkla and Shearer came to the rather surprising conclusion that the K and L X-rays, though of very different frequency, expel electrons with the same velocity when they produce ionization in a gas. Forman (*ibid.*, Jan., 1916) observes a definite increase in opacity of iron to X-rays, due to magnetization, and Webster's results on the quantum relationships of characteristic X-rays are of decided significance. He finds that none of the K lines in the X-ray spectrum of rhodium is produced until the cathode rays have a velocity sufficient to produce X-rays as short or shorter than the shortest K line. Increase of velocity after this increases the relative intensity of the K lines very rapidly as compared to the general background of rays. Of similar significance is Hull's observation (*ibid.*) that the maximum energy of the cathode particles is equal to Planck's h times the maximum frequency of the X-rays produced.

Radioactivity.—Many attempts have been made to alter the rate of decay of radioactive substances by changing physical conditions, all of which have led to negative results; perhaps the most searching is that of Danycz and Wertenstein (*Comptes Rendus*, Dec., 1915), who expose the active material to the impact of α particles from another source, without producing any effect. Richards and Wadsworth (*Jour. Am. Chem. Soc.*, Feb., 1916) have studied with great exactness ordinary and radioactive lead, finding that the density and atomic weight are both different for the two kinds of lead, but in such a way that the atomic volume is very nearly constant. The electrical charge of recoil atoms of radium and thorium have been examined by Wertenstein (*Comptes Rendus.*, Dec., 1915) and Henderson (*Nov. Scot. Inst. Sci.*, Oct., 1915), and it is found that the charge depends on the gas or vapor present. A new long range α particle from thorium has been detected by Rutherford and Wood (*Philos. Mag.*, April, 1916), and Biggs (*ibid.*, May, 1916) has brought out the very interesting fact that the energy of the secondary β-rays is not measurably altered by partly absorbing the X-rays which produced them. A summary of the constants of radioactivity is given by Wendt (*Phys. Rev.*, March, 1916).

Atomic and Molecular Structures.—Much of the recent work in light, ionization, radioactivity and X-rays deals so much with questions of atomic and molecular structure that it might well be classified under this heading. There remain to be mentioned only a few articles dealing more exclusively with questions of structure. Parson (*Smith. Contrib.*, Nov., 1915) builds up a theory in which a magneton is the nucleus, but the Bohr type of model, with a small positive nucleus as suggested by Rutherford, receives the most attention. Kossel (*Ann. d. Phys.*, March, 1916) gives further consideration to his modified Bohr structure, which, whatever one may think of its probable reality, embodies better than any other the facts recently discovered about characteristic X-rays. Fajans (*Phys. Zeit.*, Dec., 1915) summarizes recent work bearing on the periodic system, especially with reference to the radioactive elements, and Harkins and Wilson (*Philos. Mag.*, Nov., 1915) discuss structure from the standpoint of energy changes involved in atomic formation.

XXV. THE BIOLOGICAL SCIENCES

ORGANIC EVOLUTION

W. L. Tower

General Survey of Activities.—The year 1916 shows a marked decrease in activity in evolutionary research, as measured by the output of investigations since the last report. With Europe involved in war and her scientific energies consumed in lines that contribute directly to military necessities of the moment, contributions from European workers are few, and, in the main, are results which were on hand at the beginning of hostilities, new investigations being entirely absent. In the non-belligerent countries, likewise, there is a falling off of the output for the year, in number of publications and in the progress that might be expected therefrom. The general result, therefore, is that the year shows little progress in further development of general theories and concepts, with no distinctly new developments therein, but mainly the production of added data and the elaboration of instances and conditions in the field of organic evolution. Much of the latter type of investigation, however, is distinctly valuable in clarifying previous investigations and extending them, thus providing a basis for more substantial advance in the future.

The chief activities of the year center in or around the Mendelian theory of heredity: in the further investigations of the mechanism of the Mendelian principles, especially in their relations to sex, sex-linked and sex-limited characters; in the conditions of mutation in the *Œnotherae*, and the relations of this phenomenon to Mendelian mechanisms; and, lastly, in the continued and effective application of these newer genetic methods to the problems of improvement in economically valuable plants and animals, as well as to the problems of the human race. In this latter connection, eugenic discussions and opinions, the suggested methods of treatment of diverse population problems, center more and more about purely biological processes and strikingly less around the different euthenic processes. The European War and the problems of elimination and replacement of losses in belligerent populations, with the array of associated problems both biological and social, naturally have produced an extensive literature, which, unfortunately, is not of any marked value, but is mainly *à priori* opinion, dogma or propaganda not too well conceived or presented. Little that appears solid or suggestive is to be found in these war eugenic writings, and not a few of them are distinctly hysterical in statement and in language.

Establishments for investigations in organic evolution, as well as resources therefor, remain substantially as in the preceding year, and the number of workers remains about the same. A new journal for the record of investigations, *Genetics*, began publication during the year and promises to serve a useful purpose in the recording of American investigations (see also *Botany, infra*). All European journals and publications are diminished in volume and in frequency as also in regularity of issue.

Several books of general interest have appeared during the year. T. H. Morgan in *A Critique of the Theory of Evolution*, presents an attempt to interpret some of the older evolution data in terms of modern genetic research, with interesting and suggestive results; H. F. Osborn, in *Men of the Old Stone Age*, gives an admirable account of the early history of man, the remains, art, industries, and the

setting in which primitive man lived as far as known at the present time. M. Grant, in *The Passing of a Great Race*, attempts to present the picture of European peoples in the period between that covered in Osborn's work and the beginnings of European races as recorded in Ripley's *The Races of Europe*. Grant's book is not in the same class with that of Osborn or Ripley, although the opportunity was no less. The three, however, present a most attractive history of man in Europe, but are in the main silent, or at best interpretative, as to the methods and factors that were effective in the evolution of the human species. Somewhat in the same line is Huntington's *Civilization and Climate* in which are presented the author's views of the climatic effects upon the human animal and their *rôle*, especially in the development of the diverse aspects of civilization; while many do not agree with the author in his conclusions, still he raises questions that are well worth serious consideration and further investigation. R. Pearl, in *Modes of Research in Genetics*, gives useful details, formulae and methods for the prosecution of genetic investigations along the most approved lines. J. M. Coulter, in *Evolution, Heredity and Eugenics*, gives a good elementary presentation of a wide array of topics, for the use of young students especially. The usual crop of texts produced for commercial purposes have appeared during the year, none of which has any special merit or shows any advance over the usual book of this class.

Evolution Hypotheses. — Substantially no advances either in the further proof or in the elaboration of evolution hypotheses are found in the records of the year. Surveys of the present conditions of these hypotheses are good and useful, indicating in general an attempt to determine an orientation upon which to base investigations for the future. Of especial merit are Gates' "The Mutation Factor in Evolution"; J. A. Thomson, "Originative Factors in Evolution"; C. B. Davenport, "Evolution Theory in the Light of Modern Genetic Research"; H. H. Bartlett, "Mutation Theory from the Standpoint of *Œnothera*"; all present illuminating and useful surveys of the aspects of the evolution theory with which they are concerned, and in all there is present not a little of the interpretative element, of the attempt to see how far the newly developed concepts fit the observed conditions in nature. In general this is a welcome development, and no doubt one that will serve as a valuable corrective and a preventative against expenditure of effort in unproductive directions. At present, however, this interpretation has not progressed sufficiently far to enable us to estimate accurately the general value of the newer developments in evolution hypotheses.

Evolution of Species.—Few attempts to trace the evolutionary history of species are recorded. This is not unexpected, in that most of these histories are the product of European workers, who are now otherwise engaged. The most interesting perhaps is "The Ancestry of the Goose" (*Jour. Her.*), showing the probable development of the domesticated goose from the wild gray lag goose, found wild over most of the Old World. No evidence, however, as to the methods and factors in this evolution are derived from this study.

Variation and Mutation.—A sharp decline in activities in the fields of variation and mutation is noticeable, even the purely descriptive instances of "variations" of different kinds showing the lowest output in many years. The chief activities in variation center about the question of the action of selection in the alteration of characters. Much discussion between W. E. Castle and others upon this question is found in the journals of the year, but without any conclusive showing, both sides claiming proof more or less emphatically. The same problem also finds complications, not elaborated at present, in the attempted interpretation of some selection effects as due to multiple factors, multiple allelomorphs, and to diverse aspects of the pure-line hypothesis. The new data recorded, while good and carefully obtained, unfortunately are not of such a nature that "interpretation" by hostile "schools" is impossible, and as a result the entire "selection question," in its relation to the value and *rôle* of small variations in

evolution, is in a highly unsettled condition, with no distinct progress towards solution during the year.

H. S. Jennings, in "Variation, Selection and Heredity in *Difflugia Corona*" (*Genetics*), presents a continuation of his previous investigations of the same activities in unicellular organisms. He shows that the natural population consists of many hereditarily diverse stocks, and that a single stock, derived by fission from a single individual, gradually differentiated into many hereditarily diverse stocks, showing, he thinks, that selection is able to produce marked results. L. M. Standish, "What Is Happening to the Hawthorne?" (*Jour. Her.*) gives a good brief account of the curious conditions in this plant and of some of the many varieties that have been found; he suggests that the conditions are due to the hybridization of the two species and thinks that the new variants are not new species. O. Koehler ("Ueber die Ursachen der Variabitität bei Gattungsbastarden von Echiniden," *Zeit. Ind. Abs. Vererbungslehre*), gives interesting data on the variations in the characters of the hybrids in Echinoids. Statistical investigations are very few, because of the preoccupation of European biometricians and the unpopularity of biometrics in America.

Heredity.—All activities in the year in heredity center about aspects of the Mendelian theory, and investigators have either abandoned consideration of other and older concepts, or are too busy reaping the harvests to be obtained so readily in the newer field. One finds little mention of the theory of ancestral influence in heredity or of the neo-Lamarckian principles and certainly no additional evidence in their support. The records for 1916 are in the main extensions of those of the preceding year. No distinctly new aspects or concepts are found, and the investigations are largely of a routine nature, to determine the behavior of the pairs of characters under investigation. Workers are now engaged in the cataloguing of the behavior of organic characters. The investigations of T. H. Morgan and his associates, especially of the phenomena of non-disjunction and of crossing over in *Drosophila*, the further findings in the grouping of the gametic factors in this animal, in total present the best picture of the mechanism of heredity and behavior of the characters in inheritance that we possess for any organism. Among the publications of the year may be mentioned as of general interest C. B. Bridges' "Non-disjunction and its Bearing upon the Chromosome Theory of Heredity," presenting the general aspects of non-disjunction, and H. J. Muller's "Mechanism of Crossing Over in *Drosophila*," these two papers presenting a good digest of the year's advance in this aspect of hereditary behavior. E. M. East records added data in the inheritance of characters in *Nicotina;* R. H. Biffen, some interesting facts in the suppression of characters in crossing; and in the same line are the findings of G. N. Collins and J. H. Kempton (*Jour. Her.*) in "Patrogenesis," a form of heredity in which the female characters are excluded from the hybrid progeny, as shown in the crossing of the grasses *Tripsacum* and *Euchlaena.* Just how this occurs is not clear from the evidence presented and may be only one aspect of the so called "somatic segregation," a subject presented in some detail by E. J. Kraus (*Jour. Her.*).

C. H. Danforth in "Is Twinning Hereditary?" (*Jour. Her.*) recites the probable causes of twinning and gives data of the inheritance thereof, which seem to indicate an hereditary character but perhaps not entirely so. In the same class is the study of E. N. Wentworth (*Jour. Her.*) on the inheritance of fertility in swine, reaching the conclusion that it is inheritable to a certain extent. J. L. Bonhote, in *Vigor and Heredity* (London), and others give a considerable body of information on the inheritance of these physiological characters, especially those associated with the reproductive process, the determination of the behavior of which may lead to methods of much value in the production of domesticated races of high productivity and vigor in the offspring, an accomplishment of no little economic value.

C. R. Stockard (*Am. Nat.*) in his account and analysis of the inheritance of degeneracy and deformity in

alcoholized mammals gives observations of value in relation to the action of alcohol upon the progeny of parents that are strongly alcoholized, showing the inheritance of the effects of alcoholic parents. From these and parallel experiments of other investigators, social and economic conclusions of importance are likely to be drawn, but the enthusiastic advocate of prohibition should remember that very few human animals are as constantly and strongly alcoholized as are those used in these experiments.

In general, the records of the year show an increased critical attitude of investigators, more ready recognition of exceptions, less dogmatic adherence to the orthodox Mendelian concept, and a greater disposition to test out results. One notes a marked difference between the writings of today and those of five years ago, when the effort was still that of finding added instances of Mendelian behavior. We no longer doubt the truth and universality of the operation of the Mendelian principles, and through them there is now at our command a most valuable means for the analysis of the gametic, that is, the hereditary, constitution of organisms. So valuable and certain is this method of analysis that we may expect year by year analytical studies on the constitution of the germ plasm, but it will probably be a long time before there will be many analyses so complete, thorough and illuminating as that which Morgan and his associates have made on the fruit fly *Drosophila*. This is undoubtedly the best investigation of the behavior and mechanism of inheritance that has ever been made.

Heredity and Sex.—Research continues to add to the information upon the relation of sex and heredity but without any change in the general conclusions reached in previous years. The close association of sex and sex determination with hereditary phenomena continues to be shown, with differences only in unimportant details. Goldschmidt has presented during the year some additional data from his investigations of the "intersexes" in the gypsy moth, but his attempt to interpret the results is not happy and no doubt will be modified in subsequent investigations. The sex ratios also receive considerable attention; numerous instances of disproportion in the sexes of races of animals and plants are recorded, and attempts are made to interpret the findings. Some evidence is forthcoming which indicates that this disproportion of the ratios is due to hereditary agencies. H. D. King working with rats finds marked disproportions in different lines, some productive of maleness, others of femaleness, and the evidence seems to indicate that the condition is hereditary in a pure line. E. N. Wentworth, in livestock breeding, also finds evidence for the existence of lines of special expression, especially in secondary sexual characters. The *rôle* of these phenomena associated with sex may be of importance in economic work once we know the hereditary basis and action, provided they are inherited, as present evidence would indicate to be the case.

Applied Evolution.—The records of the year, especially the investigations and operations at the different agricultural experiment stations, show widespread use of modern genetic methods in the testing, improvement and development of economic plants and animals. While it has not given any conspicuous instance of accomplishment, the year shows the intensive use of intelligent experiment, in place of the one time omnipresent "selection." A wide array of topics find places in the literature of the year, from the attempts to produce a slow-burning tobacco recorded by D. Hoffmann (*Fühlings Land. Zeit.*), who finds that slow-burning leaf is probably inheritable, to high egg production in poultry, resistance to disease of domesticated plants, and so on. In all, the literature is of the application of well known principles, and in this field no advances in general principles are to be found.

Eugenics.—The literature of eugenics is if anything more voluminous than in preceding years but no more judicial in tone. Interest in eugenics, however, is increasing; the spread of the data and conclusions goes on rapidly among the general public, so that it seems certain that the agitation will produce in an educational way much benefit. To the usual eugenic

efforts which have characterized former years must be added the problems that have arisen, especially in Europe, as the direct result of the war. These problems concern in the main methods of population replacement, and the discussions are mainly suggestions as to what might be done, ranging all the way from plural marriages to state bounties for numerous progeny. In all this writing there is little that is instructive or that is based upon any determined social, economic or biological principles. In fact, one gains the impression that the entire agitation for increase in the population in the briefest possible time arises more from the desire for more men for the military establishments of the nations than for any other purpose.

Most instructive and valuable from the evolutionary viewpoint is the effort to spread information concerning the effects of disease and its *rôle* in the production of undesirable conditions in the population. Organizations of different kinds are being formed in the belligerent nations for the spread of this practical aspect of eugenics, which will no doubt be productive of much good. Eugenic surveys are also being developed, as that in Nassau County, New York, which is financed by an appropriation of $10,000 from the Rockefeller Foundation. Kansas City, Mo., also has undertaken a survey, and doubtless similar surveys will be organized within a few years in many other localities. Their findings, if the surveys are intelligently made, should provide valuable information upon many population problems, means of control, and possibly of agencies in population evolution. (See also XV, *Mental Hygiene.*)

The accumulation of information of the behavior of human traits as shown in family pedigrees still goes on, but one cannot but deplore the tendency to attribute everything that is found to the action of purely biological heredity, social heredity as a possible factor being sorely neglected or entirely ignored. Whatever may be the final solution of the problem of the production of human traits, the data that are accumulating provide evidence that there are certain combinations which it is wise to avoid in marriage, so that advice as to the desirability of prospective matings can be given in many instances with a fair degree of certainty. In this connection the Eugenics Record Office, at Cold Spring Harbor, Long Island, N. Y., undertakes to answer to the best of its ability any questions of a eugenic nature.

The following publications of general interest show the range of the activities in this field: A. E. Hamilton (*Jour. Her.*) describes the difficulties encountered in the giving of "eugenic advice"; C. B. Davenport, in "The Feebly Inhibited," presents the arguments concerning nomadism and temperament; W. F. Wilcox discusses the relations between the falling birth rate and the death rate, pointing out that the death rate is about as low as it can go, and asks what is to happen if the birth rate continues to fall (see XXVII, *Vital Statistics*). Delinquency and feeble-mindedness come in for their full share of attention, but T. H. Harris (*Jour. of Delinquency*) finds that only 25 per cent. of delinquents are feeble-minded, and holds that the remainder are the product of bad or undesirable environmental conditions (see also XV, *Mental Hygiene*). Interesting studies of baldness, as that of D. Osborn (*Jour. Her.*), show that baldness seems to be inherited in precise patterns, is confined largely to males, has no relation to the hats used, and may be a sex-limited character in its mode of inheritance.

Several semi-popular presentations of no especial merit were published during the year, although they will no doubt serve to aid the spread of a "eugenic conscience" and the data upon which the eugenic propaganda is based. Inheritable diseases of many kinds find record in the publications of the year, but conspicuously lacking in most of these records are adequate clinical pictures and determinations of the cases. In popularity as a topic for discussion, eugenics is making distinct progress, but in principles and accuracy of data and conclusions one is justified in caution, and entitled to ask for better determinations and investigations by more skilful investigators than at present usually employed.

ZOÖLOGY

David H. Tennent

Tendencies in Research.—During the year 1916, while the general trend of investigation in zoölogy has been in the direction followed for the last few years, there has been a noticeable tendency toward the wider application of the methods of modern physiological chemistry. This is a result of the gradually deepening conviction that further advance along some of the old lines is dependent upon an increase in our knowledge of the chemistry of living organisms.

Systematic Zoölogy.—In the field of taxonomy a notable contribution has been that of Pratt in his *Manual of the Invertebrate Animals* (McClurg), which is in the nature of an American Leunis. The book is one which fills a need and should prove exceedingly useful. Radcliffe (*Bull. Bur. Fish.*, xxxiv) has given an account of the sharks and rays which will be useful to investigators working on our southern Atlantic coast. Wilson (*ibid.*), working on the crustacean parasites of the fresh-water fishes of the United States, has been able to increase the list of 12 species previously known as parasitic forms, to 46, 10 of which are new to science. Rehn and Hebard (*Proc. Acad. Nat. Sci. of Philadelphia*, 68) have made a very complete investigation of the Dermaptera and Orthoptera of the Coastal Plain and Piedmont region in the southeastern United States.

Cytology.—The investigations in cytology may be grouped, in the main, about two subjects, the nature and significance of mitochondria and the nature and significance of chromosomes. Of the first group that of Cowdry is especially important. Cowdry (*Am. Jour. Anat.*, xix) has given an excellent review of our knowledge of mitochondria and of the methods used in their study. He concludes that they may now be defined in microchemical terms as well as in a morphological way, in that chemically they resemble the phospholipins and to a lesser extent the albumins. Because of this probable composition, the author feels that their function as a material basis of heredity is doubtful, but he believes that the question should remain at present an open one (see also XXVII, *Anatomy*). This opinion, like that of Wilson (*Proc. Nat. Acad. Sci.*, ii), indicates the present state of opinion on the subject. Wilson, in studying chondriosomes (which arise from numerous mitochondria) in scorpions, noted that in one, the chondriosomal material was distributed exactly and in another, irregularly. In view of this fact he is of opinion that a wide distinction should be drawn between chondriosomes and chromosomes in respect to their power of division and relation to heredity. M. R. Lewis and Robertson (*Biol. Bull.*, xxx) discuss mitochondria in the locust, *Chorthippus*, the structures being observed by tissue-culture methods. They found that mitochondria in the form of granules are present in the spermatogonia; these increase in amount during the growth stage and arrange themselves along the spindle during the division of the spermatocytes; subsequently they form the nebenkern of the spermatid and develop from this into two equal homogeneous threads in the tail of the spermatozoön. Bullard (*Am. Jour. Anat.*, xix) found that the mitochondria in cardiac muscles are not markedly decreased in inanition nor increased when fats are given as food. The neutral fat droplets in cardiac muscle do not arise from mitochondria (see also XXVII, *Anatomy*).

Of the second group of cytological papers, that of Guyer (*Biol. Bull.*, xxxi) on the chromosomes of the common fowl is particularly welcome because of the many questions which have been raised in connection with the distribution of the chromosomes and the evidence from breeding in fowl. Guyer's later studies confirm his earlier ones regarding the presence of a large curved element in primary spermatocytes, corresponding with the sex chromosome of other forms. This element seems to be bivalent, being formed by the union of two characteristic curved chromosomes. In the ovarian and nephridial tissues of the female a single curved element may be seen. At the division

of the primary spermatocytes the bivalent, curved element passes undivided to one pole, thus producing two classes of secondary spermatocytes, one with eight and one with nine chromosomes. The secondary spermatocytes, when ready for division, are of two groups, showing four and five chromosomes respectively, thus indicating that a pairing of chromosomes has taken place. It seems probable that only one group of spermatids, that with the odd element, become spermatozoa, the evidence indicating that the spermatids containing only four chromosomes degenerate. The cytological evidence now indicates that the female soma is heterozygous and the male soma homozygous, which is in harmony with the evidence from breeding with regard to sex and sex-linked characters.

Wodsedalek (*Biol. Bull.*, xxx) has presented a very complete account of the causes of sterility in the mule, based on the development of the male germ cells in this hybrid. The number of chromosomes in the ass is considerably greater than in the horse. As a consequence there is superfluous chromatin in the form of many unpaired chromosomes in the early germ-cell stages. The evidence shows that an attempt to eliminate this chromatin is made by the primary spermatocytes. Most of the cells disintegrate during the prophases of the primary spermatocytes. No secondary spermatocytes or spermatids and consequently no spermatozoa are formed.

Metz (*Jour. Exp. Zoöl.*, xxi), in a study of about 80 species of Diptera, found the chromosomes to be associated in pairs in diploid cells: this was found to be characteristic of all cells, somatic as well as germinal. Robertson (*Jour. Morph.*, xxvii), from his studies on the chromosomes in Acrididae, concludes that the chiasmatype theory of Jannsens has not been established on a firm basis cytologically and should not be accepted unreservedly. He also concludes that the degrees of variation shown in the chromosomes is paralleled by the degrees of variation exhibited by somatic structures. In this respect his views confirm McClung's hypothesis on the taxonomic value of chromosomes.

Wenrich's observations (Bull. Mus. Comp. Zoöl., Harvard, 60) on the spermatogenesis of *Phrynotettix magnus* mark a distinct advance in our knowledge. It was possible to recognize selected chromosomes in the spermatogonia and to trace these through all stages from the spermatogonia to the spermatids, thus demonstrating continuous individuality through these stages. The spermatogonial divisions showed that each chromosome forms a vesicle in the earlier telophases, and that it expands and becomes diffused within these vesicles. Although the vesicles coalesce there is always a remnant of the chromosome within the vesicle, and in the prophase the chromatin concentrates about this remnant, forming a spirally coiled thread, which develops into a prophase chromosome. Wenrich, like several other investigators, has found further evidence of the conjugation of the chromosomes in pairs by parasynapsis. Browne (*Jour. Morph.*, xxvi) after working on six species of *Notonecta* has concluded that in these forms, differences in somatic characters in the different species cannot be correlated with the differences in the number and arrangement of chromosomes. Smith (*Biol. Bull.*, xxxi) has given one of the few accounts on the cytology of the Odonata. He has shown that in the dragon fly, *Sympetrum semicinctum*, a sex chromosome is present and that two classes of spermatids are formed. Goodrich (*Jour. Exp. Zoöl.*, xxi) has determined that in *Ascaris incurva* paired bodies representing pro-chromosomes may be seen. Bachhuber (*Biol. Bull.*, xxx), working on the spermatogenesis of the rabbit, has found that 22 chromosomes are present in the spermatogonia; that there are two elements corresponding to an *x* and a *y* chromosome; and that a chromatoid body, which underwent no division and was cast off with excess cytoplasm in the metamorphosing spermatid, was present. Bridges (*Genetics*, i) in an important paper has given evidence which shows that the production by a female *Drosophila* of a daughter like herself or of a son like the father, so-called primary exceptions, may be correlated with processes of reduction and fertiliza-

tion. In the determination of this fact he has been able to show that in *Drosophila* the *x* chromosome is a differentiator of sex, while the *y* chromosome, although it has some normal function, is not necessary for the development of some male characters. Pappenheimer (*Anat. Rec.*, xi) has given a review of the literature and an account of his own observations on the Golgi apparatus, a cytoplasmic structure of considerable complexity which is present in the somatic and sex cells of all metazoa and is possibly present in all protozoa. Its function in cell metabolism is unknown. Allen (*ibid.* x) in his paper on cell division in the albino rat has presented valuable information on new methods of fixation and technique (see also XXVII, *Anatomy*). Macklin (*Biol. Bull.*, xxx) has studied amitosis in tissue from chick embryos grown *in vitro*. He has found that in this material amitosis involves only the nucleus, not the cytoplasm. He distinguishes between nuclear fragmentation, a pathological condition, and nuclear amitosis. Erdmann and Woodruff (*Jour. Exp. Zoöl.*, xx) have described for *Paramœcium caudatum* a reorganization process (endomixis) similar to that which they have previously described for *P. aurelia*. They regard it as a regulatory process which occurs in the absence of conjugation. (See also XXVII, *Anatomy*.)

Embryology.—C. W. Wilson (*Univ. Cal. Pub. Zoöl.*, xvi) has given a good account of the life history of a soil amœba. He has considered division by binary fission, reconstruction of the nucleus, chromidial formation, encystment and enflagellation. The flagellate stage is of brief duration, the flagellates sinking down on the substratum and becoming amœboid. Gametogenesis and syngamy have not been found, although isolated instances resembling stages in syngamy have been seen.

Hartman (*Jour. Morph.*, xxvii), in his study of the development of the opossum, *Didelphys virginiana*, has presented evidences that the mature egg of the opossum shows no polarity; that there is an elimination of yolk along the entire periphery at the time of the first cleavage, the two blastomeres forming a new membrane; and that as cleavage proceeds, the blastomeres migrate to the periphery and become closely arranged against the zona pellucida. He has also shown that the endoderm is formed by the proliferation of specialized "endoderm mother cells" which appear only in the embryonic area of the blastocyst (see also XXVII, *Anatomy*). Spurgeon and Brooke (*Anat. Rec.*, x) also have investigated the early development of the opossum and have given an account of the early segmentation which differs from that of Hartman in that they describe polarity as noticeable at the beginning of segmentation. They also describe the giving off of fragments, or extrusion, of cytoplasm and yolk from the egg at the time of the first cleavage (see also XXVII, *Anatomy*).

Locy and Larsell (*Am. Jour. Anat.*, xix) have given a very adequate description of the development of the lung of the domestic fowl, a precise study of the development of the bronchial tree, of the air sacs and of the recurrent bronchi (see also XXVII, *Anatomy*). Bremer (*ibid.*) has shown that in animals in which there is an early degeneration of the Wolffian body, the placenta is provided with an apparatus similar to that found in the glomeruli of the Wolffian body or kidney, i. e., thin plates of epithelium overlying the fœtal capillaries (see also XXVII, *Anatomy*). Jordan (*ibid.*) has described the angioblast in pigs as arising from mesenchyma (see also XXVII, *Anatomy*). He has found that the mesenchyma may differentiate directly into endothelium or into hæmatoblasts. In the yolk sac of pig embryos of 5-15 mm. the stages in hæmatopoiesis, represented successively by hæmatoblasts, erythroblasts and normoblasts, with transition stages, are present in abundance. Emmell (*ibid.*) has studied the masses, or clusters, of cells which are found firmly attached to the wall in the aorta of mouse, rabbit and pig embryos (see also XXVII, *Anatomy*). These have arisen from the vascular epithelium. He regards this condition as being opposed to the theory that the endothelium of the vascular system does not contribute to the formed elements of the blood. He believes that under certain abnormal

conditions the vascular epithelium may proliferate cells which are added to the free elements of the blood. Jordan (*Anat. Rec.*, x) in a similar investigation had reached conclusions of the same nature (see also XXVII, *Anatomy*). Shipley (*ibid.*) has pointed out the possibilities of tissue-culture methods in hæmatological investigations (see also XXVII, *Anatomy*). He has shown that red blood corpuscles, for the most part abnormal, developed in tissue taken from the area opaca of the chick before the formation of blood islands and the elaboration of hæmoglobin. He is of the opinion that the hæmoglobin-bearing cells develop from colorless amœboid elements of probable mesoblastic origin. Danchakoff (*ibid.*), in urging the monophyletic origin of blood cells, has presented evidence that mesenchymal cells of the mesoderm are the source of various differentiation products (see also XXVII, *Anatomy*).

Gudger (*Zoölogica*, ii) has given a general account of the development of the gaff-topsail catfish, a form in which the male carries the eggs, during development, in the mouth. The description has been made from a series complete with the exception of segmentation stages. Ball (*Jour. Morph.*, xxvii) has described the origin of the two or more embryos found in the capsules of *Paravortex gemellipara*, a Rhabdocoel, as due to the enclosure of two or more eggs within the shell secreted by the shell gland. Grave (*ibid.*) has concluded that the peculiarities in origin of the cœlomic pouches of *Ophiura brevispina* and other echinoderms having large yolk-laden eggs may be due to the fact that organ-forming substances which ordinarily flow together at the time of fertilization are prevented from fusing by the mass of inert yolk which fills the egg. (See also XXVII, *Anatomy*.)

Experimental Embryology.—Conklin (*Proc. Nat. Acad. Sci.*, ii), working with the eggs of *Crepidula*, has reached the conclusion that it is difficult but not impossible to change the polarity of eggs, and that the persistence of polarity is due to a somewhat resistant framework of protoplasmic strands which serve to preserve the relative positions of nucleus and centrosphere in the cell axis. Packard (*Jour. Exp. Zoöl.*, xxi), as a result of experiments with radiations of radium in *Arbacia*, has concluded that a brief but intense radiation during certain stages produces acceleration of development. This effect he believes may possibly be due to the acceleration of the action of enzymes in the production of oxidation. Werber (*ibid.*) has shown that chemical modification of the environment may produce blastostylosis, resulting in the elimination of present or potential organ-forming material. The chief cause of teratogeny is probably parental metabolic toxæmia. Loeb (*Proc. Nat. Acad. Sci.*, ii) has reported on the sex of parthenogenetic frogs, which were obtained by pricking the unfertilized egg. Of seven frogs, now more than a year old, two have been examined cytologically and have been found to be males. (See also XXVII, *Anatomy*.)

General Physiology.—R. S. Lillie (*Jour. Exp. Zoöl.*, xxi) has advanced this hypothesis of cell division: the change of form is the result of two chief factors.

> (1) A definitely localized increase of surface tension, resulting directly from increased permeability and decreased electrical polarization of the cell surface, over two symmetrical areas centering at the poles and extending to near the equator; and (2) a secondary or adjuvant effect of the same kind due to the diffusion of electrolytes from the astral centers.

C. R. Moore (*Biol. Bull.*, xxxi) has concluded that the superposition of fertilization on parthenogenesis in *Arbacia* is impossible where the activation of the egg by the parthenogenetic agent is complete. M. R. Lewis (*Anat. Rec.*, x) has reported on the successful adaptation of sea water as a tissue-culture medium (see also XXVII, *Anatomy*). Child (*Biol. Bull.*, xxx) has shown for the sea urchin, *Arbacia*, the presence of a distinct gradient in susceptibility to various reagents along the apico-basal axis of blastula, gastrula and later stages of larval development. Child (*Jour. Exp. Zoöl.*, xxi), from his experiments on the control of the head form in *Planaria*, has concluded that two factors are concerned in determining whether a head shall develop on a piece or not: (1) reaction of cells adjoining

the cut surface, and (2) stimulation of the piece as a whole following section. Hyman (*ibid.*, xx) has demonstrated in *Oligochaetes* a gradient in the rate of metabolism. In the formation of zoöids the gradient of the zoöid becomes independent of the gradient of the parent animal. Shull and Ladoff (*ibid.*, xxi), working on *Hydatina senta*, have concluded that oxygen in the water increases the production of males. The effect of oxygen was most marked in its counteraction of agencies which diminish the production of males. Whitney (*ibid.*, xx), working with pedigreed cultures of *Hydatina senta*, has confirmed his earlier work to the effect that a diet of colorless flagellates causes only female-producing daughters to be formed, while a diet of green flagellates causes the production of a very high percentage of male-producing daughters. Whitney (*Biol. Bull.*, xxxi) has also obtained very interesting results in causing the rotifer *Brachionus pala* to change to *Brachionus amphiceros* by the addition of sodium silicate to the culture medium.

Ewing (*ibid.*) has found that long continued parthenogenetic reproduction by the aphid *Aphis avenae* did not affect its size, color or fecundity. Rogers and Lewis (*ibid.*) have made some interesting thermo-couple determinations of the relation of body temperature of certain cold-blooded animals to the temperature of the environment. A quick and close adjustment is made by the earthworm and the small, spotted salamander; a slower but similar adjustment is made by the fresh-water mussel and the goldfish. R. S. Lillie (*ibid.*, xxx) in discussing the theory of anæsthesia has concluded that under the influence of a narcotizing agent the plasma membrane undergoes an increase in its general stability or resistance to alteration. The cell is thus shut off from the disturbing effects of environmental changes.

Willis (*ibid.*) has reached the conclusion that the nucleus in amœba directly influences the attachment of the protoplasm to the substratum. Shaeffer (*Jour. Exp. Zoöl.*, xx) has described the formation of food cups by amœba in its feeding. Mast and Root (*ibid.*, xxi) have reached the conclusion that the action of surface tension plays a minor *rôle* in the process of feeding by amœba. Mast and Lashley (*ibid.*) have found that the feeding cone in *Paramœcium*, *Stentor* and *Spirostomum* is not continuously produced and that in the circumstances of its production it cannot be of great value in ascertaining the character of the environment in front of the animal.

Parker (*ibid.*) has described the effector systems of actinians as those responding to environmental changes. He has classified them as the mucous, nematocyst, ciliary and muscular systems. Of these four, the first three are independent of the control of the nervous system; the muscular system is in part dependent on, in part independent of, nervous control. Nonnervous muscular responses are relatively slow. Cary (*ibid.*) has determined that regeneration in insulated halves of the disk in *Cassiopea* is more rapid on the portion on which the sense organs have been allowed to remain.

Loeb and Wasteneys (*ibid.*, xx), working on the relative efficiency of various parts of the spectrum for the heliotropic reactions of animals and plants, have found that in the forms used there seem to be two sorts of heliotropic substances, one with a maximum of sensitiveness in the yellow green region, and the other with a maximum of sensitiveness in the blue. The two groups of substances are distributed independently of the boundaries between animals and plants. Goodale (*Biol. Bull.*, xxx) has investigated further the development of male plumage in ovariotomized fowl. He has found that the organ formed on the site of the excised ovary is not an ovary or a testis, but is probably a development of the Wolffian body.

Physiology.—Bensley (*Am. Jour. Anat.*, xix) has found that in the thyroid, during the normal mode of secretion, the secretion is formed in the outer pole of cells and excreted directly into the vascular channels of the gland. The interfollicular colloid represents a storage product stored during hyper-activity of the gland. Jackson (*ibid.*) has concluded that in young rats held at maintenance the

follicular epithelium of the thyroid becomes atrophied. The interfollicular colloid may show no abnormal changes; advanced stages of degeneration of the follicular epithelium are accompanied by dissolution and disintegration of the colloid. Pearl (*Proc. Nat. Acad. Sci.*, ii) has found that the feeding of pituitary substance (anterior lobe), and corpus luteum to growing chicks retards growth. Hoskins (*Jour. Exp. Zoöl.*, xxi) has obtained evidence that the feeding of hypophysis and pineal material produces no marked or constant effect upon the body or organs of albino rats. The feeding of thymus is without effect, while thyroid may cause hypertrophy of the heart, liver, spleen, kidneys and suprarenal glands. The statements are made throughout for the dosages employed.

Adaptation.—Andrews (*ibid.*, **xx**) has shown that the rapid and striking color changes shown in the rhinoceros beetle, *Dynestes tityrus*, are dependent on moisture. The material composing the outer layer of the exoskeleton is such that it readily absorbs and gives off moisture from the air as well as from liquid. Laurens (*ibid.*) has pointed out that the ordinary reaction of pigment cells in the skin of animals to light is to expand. When this does not take place it is due to the controlling regulatory influence of the eyes. Mast (*Bull. Bur. Fish.*, xxxiv) has made a long series of experiments on the changes in shade, color and pattern of the flounders *Paralichthys* and *Ancylopsetta*. Simulation of the background is more perfect in *Paralichthys*, which on a white background may become almost pure white; on black, nearly black; on gray, gray of nearly the same shade; and on blue, green, yellow, orange, pink or brown, a color remarkably similar to that of the background. The time required for adaptation to color is longer than for adaptation to shade or pattern. Young (*Jour. Exp. Zoöl.*, xx) has concluded from a considerable experience with the habits of caged birds that stillness is probably a more important factor than color in protecting animals from their foes.

BOTANY

B. M. Duggar

Journals.—In the Year Book for 1914 (p. 652) special attention was drawn to the increase in the number of botanical journals in the United States. Since that time several additional periodicals have appeared, and while only one is strictly botanical, the remainder, fortunately, offer facilities for the publication of botanical material in several of the applied fields, where the congestion of papers has been particularly acute. The new journals are: (1) *Addisonia* (New York Botanical Garden), devoted exclusively to colored illustrations of native plants accompanied by descriptive material; (2) *Soil Science* (edited at New Brunswick, N. J.), accepting papers in bacteriology and plant physiology "when they may contribute directly to our knowledge of soil fertility;" (3) *Journal of Bacteriology* (official organ of the Society of American Bacteriology), publishing a classified review of bacteriological literature; and (4) *Genetics* (edited at Princeton University).

General.—Students in histology will find a well arranged text in the third edition of Stevens' *Plant Anatomy*, written from the point of view of the student whose interest should be directed also to physiology and phylogeny. Part I of Ganong's new manual, *A Textbook of Botany for Colleges*, though finding a basis in morphology, is written largely from the standpoint of physiology and ecology, discarding entirely from this part any such consecutive outline of the plant kingdom as characterizes many other texts. Gager in his *Fundamentals of Botany* emphasizes the physiological and utilitarian aspects of the subject, and while he does not discard the usual typical outline of groups, he gives these without reference to relationship or origin. Among other American works of special interest to botanists are the following: The third edition of Chamberlain's *Method in Plant Histology*, completely rewritten and up to date; Mathew's *Field Book of Trees and Shrubs*, intended

as a semi-popular handbook of woody plants; Child's *Senescence and Rejuvenescence*, which, while written largely from the zoölogical standpoint, is of special interest to botanists; and Child's suggestive work, *Individuality in Organisms*, essentially a new presentation of a dynamic theory of the origin and maintenance of individuality, and, on the whole, a philosophical discussion.

Taxonomy.—While there have been no extensive new plans announced in the field of taxonomy during the year, the amount of material published shows a greater activity than for some years previous. From the Arnold Arboretum Sargent's *Plantae Wilsonianae*, or list of woody plants collected in China, has reached the third volume. Piper and Beattie have issued a *Flora of the Northwest Coast*, embracing that part of Washington and Oregon constituting a natural region lying west of the Cascade Mountains. The number of species reported is 1,617, among which, it is interesting to note, there are 22 species of conifers and a single species of oak. An extensive monograph of *Phoradendron*, the mistletoes, by Trelease (published by the Univ. of Illinois), is a complete revision of the genus with descriptions and illustrations of about 300 valid species and varieties. The *Trees of Vermont* (Vt. Agr. Exp. Sta., Bull. 194), by Burns and Otis, gives a somewhat popular systematic treatment of the trees of the state. The contributions from the U. S. National Herbarium deal chiefly with central and tropical American phanerogams, together with notes on plants of lower California collected by a recent expedition.

Among the numerous other short papers on the seed plants, space permits the consideration of only a few. Fernald and Weatherby (*Rhodora*, xviii, 1, 181) have revised the genus of halophytic grasses, *Puccinella*, for the eastern part of the country, with 11 species and three varieties; notes on some western species also are given. St. John (*ibid.*, 121) contributes a revision of the Potamogetons of the section Coleophylli, limiting this account to American forms, five species and two varieties being described, with extensive citations. Notes on interesting plants collected in the southern states are given by Pennell (*Bull. Torrey Bot. Club*, xliii, 93, 407), considering thus far primarily the genera *Commelina* and *Smilax*. Blake (*Rhodora*, xviii, 53) describes three new species of sea lavender, and revising the North American forms, reports nine species. Rowlee (*Bull. Torrey Bot. Club*, xliii, 305) has determined an interesting collection of plants made by Furlong in southern Patagonia, 166 species being reported. The genus *Panicum* is recently treated by Hitchcock (*N. Am. Flora*, xvii, part 3, 197), who reports for North America 211 species, among which he is sponsor for 32.

Work on the Pteridophyta and Bryophyta constitutes each year a very small part of taxonomic endeavor. It is, however, of special interest to report a few papers showing the progress in this field. A serviceable popular guide to the names of the northeastern states is contributed by Dunham. Williams (*Bull. Torrey Bot. Club*, xliii, 323) gives a list of about 70 species of mosses collected in Peru as an incidental result of the Yale expeditions of 1911 and 1915. Evans (*Rhodora*, xviii, 74, 103) concludes his treatment of North American *Hepaticae*.

Among many papers reporting new species or giving descriptions of fungi, the following have special interest attaching to some important group. Burt (*Ann. Mo. Bot. Gard.*, iii, 203) continuing his studies of North American *Thelephoraceae*, revises the genus *Hypochnus*, retaining under it such *Corticium*-like species as possess rough, echinulate, or colored spores. Thirty-one species are described, of which 14 are new and 12 represent new combinations. Discussing the Perisporiaceous genus *Meliola* on the basis of collections made in Porto Rico, Stevens (*Ill. Biol. Mon.*, ii, no. 4) records for the island 95 species and six varieties on 53 families of hosts. Thaxter (*Proc. Am. Acad. Arts and Scie.*, lii, 1) has further enriched the genera *Chitonomyces* and *Rickia* of the *Laboulbeniaceae* by the description of 14 and 37 species, respectively, all from tropical regions. Murrill (*N. Am. Flora*, ix, 375) continues an account of *Agariceae*.

Morphology. — Hoar (*Am. Jour. Bot.*, iii, 413), through an anatomical study of *Betulaceae*, argues for the primitive position of this family among dicotyledons, as opposed to a higher position resulting through reduction in characters. The results of an anatomical investigation of species of *Piper* by Hoffstadt (*Bot. Gaz.*, lxii, 15) suggest that these plants should be placed well towards the level of monocotyledons, confirming the opinion derived from a study of the female gametophyte. Studying reduction divisions in *Allium tricoccum*, Nothnagel (*ibid.*, lxi, 453) interprets the heterotypic division as following the initiation of a regular somatic division, which latter, however, is only typically completed in the homotypic division. Weatherwax (*Bull. Torr. Bot. Club*, xliii, 127) finds that while normally the maize plant is monœcious, "every flower of either sex contains either rudimentary or functional elements of the opposite sex."

As a result of studies which he has been able to base upon excellent material secured in Java and Ceylon, Thompson (*Am. Jour. Bot.*, iii, 135) contributes a detailed study of *Gnetum* enabling him to present suggestions as to relationships (1) within the order, (2) to the Gymnosperms, and (3) to the Angiosperms and their probable origin. He would conceive the Angiosperm ancestors as related to modern *Gnetales*. Chamberlain (*Bot. Gaz.*, lxi, 353) has studied *Stangeria paradoxa*, the most fern-like of the Cycads, with respect to the life history of the gametophytes, fertilization, and embryogeny. Among interesting features are an apparent haploid condition of the chromosomes at fertilization, an evanescent segmentation of the egg, and two free nuclear periods in the embryogeny.

Investigating the genus *Treubia* of the liverworts, Campbell (*Am. Jour. Bot.*, iii, 261) concludes that it is nearer to the *Acrogynae* than the related *Fossombronia*, differing essentially from the *Pellia* type, and that *Treubia* and *Fossombronia* may, perhaps, be associated rather with the *Sphaerocarpales* than the *Codoniaceae*. McAllister (*Bull. Torr. Bot. Club*, xliii, 117) would include *Thallocarpus* in the *Marchantiales*.

Dunn (*Plant World*, xix, 271) finds the tetrasporangia of *Dumontia filiformis* to originate from subcortical mother cells. The chromatophore segments and the parts persist even in the tetraspores. Roe (*Bot. Gaz.*, lxi, 231) has studied the development of the conceptacle in *Fucus* and she pictures a clear line of advance from *Nereocystis* through such families as those represented by *Ectocarpus, Laminaria, Dictyota*, and *Hormosira*, to *Fucus* and its allies. As a continuation of similar studies previously reported, the origin and development of the lamellae of *Coprinus* has been studied by Atkinson (*ibid.*, 89) and of *Cortinarius* by Douglas (*Am. Jour. Bot.*, iii, 319). These genera represent the *Agaricus* type of development of the gill cavity, hymenial primordium, and lamellae.

Physiology.—As a result of experiments conducted at the Cinchona Laboratory, Jamaica, Harris and Lawrence (*Am. Jour. Bot.*, iii, 438) report a study on the osmotic pressure of tissue fluids in parasitic *Loranthaceae*. In general they established the point that the osmotic pressure of the sap of the parasite is usually greater than that of leaves of the host. Investigating by cryoscopic means the vegetation near Tucson, the same authors find considerable differences between the various vegetation forms in respect to the osmotic concentration of the expressed sap. G. T. Harrington (*Jour. Agr. Res.*, vi, 761) has made an extended study of impermeable seeds, especially those of *Leguminosae*, determining the relations of these to various conditions, with special reference to winter endurance and agricultural value. Clowes (*Jour. Phys. Chem.*, xx, 407) has investigated the effect of various electrolytes on the equilibrium of such physical systems as emulsions, sols, and jells, with the purpose of explaining the antagonistic effects which have been found so important in living cells.

The water relations of plants continue to keep the attention of a large number of physiologists. In fact, so considerable is the number of papers in this field that no detailed analysis of the results can be given. The foliar transpiring power has been in-

vestigated by Bakke and Livingston (*Phys. Res.*, ii, 51); some of the causes of variation in transpiring power of cacti have been cleared up by Shreve (*ibid.*, 73); detailed studies with respect to transpiration as a factor in crop production are given by Kiesselbach (Neb. Agr. Exp. Sta., Res. Bull. 6); the moisture equivalent has been shown to be generally serviceable for the indirect determination of the hygroscopic coefficient by Alway and Russel (*Jour. Agr. Res.*, vi, 833); extensive observations and data showing how transpiration rates are affected by environmental factors lead Briggs and Shantz (*ibid.*, v, 583) to the conclusion that under conditions favorable to high evaporation plants fail to respond continuously as free evaporating systems; and with special reference to the water requirements, Miller (*ibid.*, vi, 311, 473; *Am. Soc. Agron.*, viii, 129) has materially advanced our knowledge of root systems.

An interesting study of the relations of a parasitic fungus to the culture environment, and of the suitability of the environment to call forth various developmental phases in the fungus, has been made by Coons (*Jour. Agr. Res.*, v, 713), and it represents a type of investigation which might well be applied to other fungi. Link (*Bot. Gaz.*, lxi, 169), in arriving at differences between *Fusarium trichothecioides* and *F. oxysporum*, contrasts their physiological characteristics, as well as their pathological relations, while Pool and McKay (*Jour. Agr. Res.*, vi, 21) discuss the relation of vitality and development of *Cercospora beticola* to climatic conditions.

Spoehr (*Plant World*, xix, 1) draws attention to some of the failings of the formaldehyde hypothesis of photosynthesis and suggests a more complex set of reactions. Through a variety of pure culture experiments with corn, field pea, radish, vetch, and other plants, Knudson (Cornell Agr. Exp. Sta., Memoir 9, 1) shows the effects of various sugars on growth and respiration, with much of collateral interest. That alkaloids may not exist as such in the poppy plant but arise as a result of the action of oxidases on constituents of the latex in the presence of oxygen, is suggested by True and Stockberger (*Am. Jour. Bot.*, iii, 1). Holman (*ibid.*, 274) relates the flat curvature, or slow assumption of the vertical, of both primary and secondary terrestrial roots in air (the roots have been displaced from the vertical) to the absence of mechanical resistance, this applying both to the primary and the secondary curvature. The amount of water in the medium, change in geotonus, and thigmotropism are eliminated as factors, he concludes. The rest period of potatoes is shown by Appleman (*Bot. Gaz.*, lxi, 265; *Am. Jour. Bot.*, iii, 223) to be related to the impermeability of the skins to oxygen. Moreover, skin characters are greatly affected by moisture conditions. He also finds that catalase activity in the potato juice is related to respiratory activity, while there is no connection between the latter and oxidase action. Reed (*Bot. Gaz.*, lxi, 430, 523; lxii, 233) contributes valuable data indicating (1) how to calibrate reagents for the measurement of oxidases, (2) the desirability of measuring the oxidation potential of the solutions employed in order to show progress of the reaction, and (3) some points regarding the mode of action of plant oxidases. Important suggestions result from an investigation by Robbins (*Am. Jour. Bot.*, iii, 234) of the influence of certain salts and nutrient solutions on the secretion of diastase by *Penicillium Camembertii*. Through detailed studies on *Opuntia versicolor*, Richards (Carnegie Inst. Wash. Publ. 209, 1) gives extensive data regarding gas interchange, acidity, and the effects of various factors upon acidity as well as upon the respiratory quotient. Livingston (*Phys. Res.*, i, 399, 421) develops in some detail suggestions regarding the use of physiological indices of temperature efficiency in plant growth, likewise the use of a single index to represent both temperature and moisture conditions. True and Bartlett (*Am. Jour. Bot.*, iii, 47) give further interesting data on the absorption of ions by plant roots in relation to the diversity and concentration of ions in the solution. Lipman (*Plant World*, xix, 83, 119) presents a critique of the lime-magnesia ratio, and Wyatt (*Jour. Agr. Res.*, vi, 589)

reports particularly the tolerance of certain plants for magnesia and lime-containing substances. Headley, Curtis, and Scofield (*ibid.*, vi, 857) give the results of an elaborate series of experiments on the effects of sodium salts on plant growth, with special application to salt-land conditions. Continuing work which has extended over some years, Rigg (*Am. Jour. Bot.*, iii, 436; *Bot. Gaz.*, lxi, 159, 295) reports a study of some of the physical factors under bog conditions, the toxic action of certain products of decay, and the probability that colloidal matter is a large factor in the toxicity of certain bog waters.

Ecology.—Considerable progress has been made in the ecological aspect of the subject, especially in the way of regional or locality studies. Brown (Ohio Biol. Surv. Bull. 7, vol. ii, 116) contributes a study of the Cincinnati region. She relates the plant formations of the region to the topography and defines the successions. In the Cincinnati region all successions tend toward a mesophytic forest formation. Reporting an intensive study conducted during four years upon the dry grassland of a northern Colorado mountain park, Ramaley (*Plant World*, xix, 249) recognized five seasonal periods and discusses particularly the various societies in the main succession, including also a list of species and a brief account of the environmental factors. Continuing important researches upon the vegetation of Connecticut, Nichols (*Bull. Torr. Bot. Club*, xliii, 235) here describes the plant societies along rivers and streams, treating these, as in his previous studies, in respect to succession. In this case, particularly, the influence of topography as a factor is important, while in the previous studies biotic features alone required emphasis. Shreve (*Plant World*, xix, 53) indicates the broad relations of the field of plant geography and argues for the experimental method, the latter, of course, involving the complete analysis of the environment and a painstaking study of the physiology of the plants concerned. The same author (Carnegie Inst. Wash. Publ. 217) correlates in a striking manner the climatic relations in the Santa Catalina Mountains with the differences exhibited by the vegetation at the various altitudes. It is shown that physical factors control the distribution and movement of the vegetation. Shreve (Carnegie Inst. Wash. Publ. 195) has studied also the interesting rain-forest of the Blue Mountains of Jamaica, giving special attention to the measurement of climatic factors on the floor of the forest and in its canopy. Interesting notes made by the late Charles Hughes Shaw (*Bot. Gaz.*, lxi, 477), edited by Romer, afford the only record of the ecological work which was done during several seasons by Shaw in the Selkirk Mountains in western Canada.

PALÆONTOLOGY

CHARLES R. EASTMAN[1]

Invertebrates.—Owing to disturbed international conditions the number of foreign contributions to the literature of palæontology is almost negligible. In this country the most important work on the invertebrate division of the science is contained in the two volumes on the Upper Cretaceous of Maryland, published by the Geological Survey of that state. It is illustrated by a handsome series of plates.

Dr. C. D. Walcott, in continuation of his studies of Cambrian geology and palæontology, has published the third of a series of papers that bears the title of "Cambrian Trilobites" (Smithson. Misc. Coll., Publ. 2420). It is accompanied by 23 excellent plates. In the *Proceedings* of the U. S. National Museum, Prof. T. D. A. Cockerell has two papers on American and British fossil insects, Prof. H. S. Williams one on new Silurian brachiopods from Maine, and Dr. W. H. Dall one on the Oligocene fauna of Flint River, Georgia. In Bulletin 96 of the same institution, Dr. R. S. Bassler and Ferdinand Canu have published a "Synopsis of American

[1] For notes on fossil reptiles and mammals the writer is indebted to his colleagues, Drs. W. K. Gregory and W. D. Matthew, of the American Museum of Natural History.

Early Tertiary Cheilostome Bryozoa." Dr. A. F. Foerste is author of an important memoir on the Upper Ordovician formations in Ontario and Quebec, published by the Canadian Geological Survey.

Fishes.—Some new anatomical features regarding the peculiar arthrodiran genus *Homosteus* are described by Dr. A. S. Woodward in the *Journal* of the Torquay (England) Natural History Society. New investigations on British Palæozoic ganoids and lung-fishes have been conducted by Dr. D. M. S. Watson and Henry Day (*Mem. and Proc. Manchester Lit.* and *Phil. Soc.*, lx, pt. 1), and the latter author has issued also a "Note on the parasphenoid of a Palæoniscid" (*Ann. Mag. Nat. Hist.*, xvi, 421).

The remarkable spirally coiled dental organs of *Helicoprion*, from the Permian of Russia, form the subject of two communications by A. Karpinsky, the original discoverer of these remains. A new species, *H. clerci*, is described by him from the Artinsk beds. The reference of this genus to the Cestraciont group of sharks seems now fully warranted. Dr. A. S. Woodward has also discovered evidence (*Nature*, Oct. 26, 1916) which points to the derivation of *Edestus* from the *Campodus*-like type of dentition.

Comparatively little has been added to our knowledge of fossil fishes from North America during the year. Dr. L. M. Lambe has described a few ganoids from the strata of Lower Triassic age near Banff, Alberta (*Trans. Roy. Soc. Canada*, x), and others from the coal measures of Linton, Ohio, have been investigated by L. Hussakof (*Bull. Am. Mus. Nat. Hist.*, xxv). A report upon the collection of fossil fishes contained in the U. S. National Museum has recently been published by C. R. Eastman (*Proc. U. S. Nat. Mus.*, lii). It includes descriptions of a number of new species.

Amphibians and Reptiles.—Dr. R. L. Moodie's important monograph (Carnegie Inst. Wash. Publ. 238) on the *Coal Measures Amphibia of North America* adequately summarizes and illustrates the numerous and highly varied types of the oldest well known land-living vertebrates, which are first foreshadowed by a single footprint from the Upper Devonian of Pennsylvania. The amphibians of the Carboniferous age were mostly swamp-living forms, embracing small lizard-like, newt-like and serpentiform types; there were also larger animals related to the Labyrinthodonts of succeeding ages.

The amphibians and reptiles of the "Red Beds" of Texas, New Mexico and elsewhere are very fully discussed in a monograph by Prof. E. C. Case (Carnegie Inst. Wash. Publ. 207). After describing the geography and environments of Permo-Carboniferous times, the author gives an extended analysis of the fauna, in which he discusses the food supply and food habits as well as the terrestrial and aquatic adaptations of these animals. A majority of the forms were partly aquatic, and more or less raptorial and carnivorous, but some of them fed upon insects, others upon mollusks, and still others to some extent upon plants.

The author discusses the conflict between the defensively and offensively armed types and shows that many of the amphibians and reptiles were so overspecialized that they became extinct at the end of this period. Two of the reptilian families and one type of amphibians developed excessively long spines on the back, which the author believes to have been useless to these animals. He suggests that owing to the abundance of the food supply and to the perfection of the weapons of offense, the surplus vitality thus generated was used in the continued elaboration of certain structures, which were possibly useful in their inception, but finally became elements of weakness, and led to the extinction of the group. The monograph is accompanied by many restorations of these animals, by full faunal lists, and by a welcome discussion of the classification.

Prof. S. W. Williston also continues his investigations of American Permian vertebrates (*Contr. Walker Museum*, i, no. 9, 165). He gives first a full description of the skull of *Pantylus*, a cotylosaurian reptile which retains a very primitive skull pattern, and second, an invaluable and well illustrated synopsis of the whole fauna of Permian amphibians and reptiles.

These forms continue to yield many facts of great morphological interest. For example, the author holds that the almost universally accepted view of the origin of the sternum or breastbone from the fusion of the distal and ventral ends of dorsal ribs in the midline is quite incorrect, and that the conditions in the early vertebrates prove conclusively that the sternum has been derived rather through the fusion of the "ventral ribs," or gastralia, which were not cartilaginous, but dermal bones, arranged originally in many rows of small rhomboidal ossicles.

Morphological interest is predominant also in D. M. S. Watson's description (*Bull. Amer. Mus. Nat. Hist.*, xxxv, 611) of the brain case in *Eryops* and other Permian types which had an extremely low and primitive type of brain and inner ear. New Permian amphibians and reptiles of South Africa are described in a series of papers from the Transvaal Museum by Dr. Van Hoepen (*Ann. Transvaal Mus.*, v., no. 2, 125), and from the South African Museum by S. H. Haughton (*Ann. South African Mus.*, xii, 65). The amphibians include most of the groups found also in the Permian of North America. *Myriodon* and *Rhinesuchus*, which are allied to the American *Eryops*, are represented by nearly complete skeletons.

Lieut. R. Broom continues his description (*Proc. Zoöl. Soc. London*, xii, 363) of South African Triassic amphibian specimens in the British Museum. He also describes several new anomodont reptiles (*ibid.*, 355).

Several new Phytosaurs of the Trias of Texas and adjoining states are described by M. G. Mehl (*Bull. Univ. Oklahoma*, ser. no. 5, pp. 5, 26; *Jour. Geol.*, xxiii, no. 2). Of these long-snouted, gavial-like forms, *Machæroprosopus* and *Angistirhinus* are represented by very good skulls. The same author has discovered an ancestor of the South American caiman in the Oligocene of South Dakota (*Jour. Geol.*, xxiv, no. 1).

Among sauropod dinosaurs, Dr. W. J. Holland (*Ann. Carnegie Mus.*, x, 143) has described briefly a new species, *Apatosaurus louisæ*, discovered in the great quarry near Jensen, Utah, from which the Carnegie Museum has recovered a very important series of dinosaur skeletons.

Barnum Brown continues his descriptions (*Bull. Am. Mus. Nat. Hist.*, xxxv, 701) of the varied dinosaur fauna of the Cretaceous of Alberta, describing several new types of duck-bill dinosaurs, one of which is ancestral to the crested dinosaur *Saurolophus*. The same author describes (*ibid.*, 709) a remarkably well preserved skeleton of another crested dinosaur which had a high skull crest resembling that of a cassowary. Some interesting notes on the marine Triassic reptile fauna of Spitzbergen have recently been contributed by Dr. Carl Wiman (*Univ. Cal. Pub. Geol.*, x, no. 5, Nov., 1916).

Mammals.—Dr. W. K. Gregory (*Bull. Am. Mus. Nat. Hist.*, xxxv, 239) has continued his researches upon the evolution of the primates. In a preliminary discussion of the theory of trituberculy, he shows that the tritubercular molar is the primitive type for primates as for other mammalia, and discusses the origin of this type of tooth. He then reviews critically what is known of fossil anthropoidea and discusses their relationships to man and to the existing anthropoid apes. The shortening of the face and reduction of the front teeth in man he regards as an adaptation mainly to predaceous habits and a carnivorous diet, replacing the primitive fruit-eating adaptation of his anthropoid ancestors. This is necessarily associated with the exclusive use of the hands and of weapons for attacking and dividing the prey, in contrast with the use of the teeth for those purposes among the carnivora.

In his discussion of the phylogeny Dr. Gregory combats strongly the tendency of several recent authors to carry the divergence between the human and anthropoid stems far back into geologic time. He considers "that the Upper Miocene ancestors of the Hominidæ were at least very closely akin to the Upper Miocene common ancestors of the chimpanzee and gorilla, and that they were in fact heavy-jawed, stout-limbed, tail-less and semi-erect anthropoid Catarrhinae, with quadritubercular second and third upper molars and *Sivapithecus*-like lower molars." Nor does he re-

gard the Neanderthal man as wholly excluded from the direct ancestry of the higher races.

Of high importance likewise is Stehlin's revision of the Eocene primates of Europe (*Abh. Schweiz. Paläont. Gesell.*, xli, 1299), now completed. The author gives an extended and well illustrated description of the genera hitherto known, and adds a number of new forms, the most interesting of which are the Chiromyoidea, resembling the modern aye-aye (*Chiromys*) in the rodent-like front teeth, and in the author's opinion related to this group of lemurs. All of the primates of the European Eocene are in the lemuroid stage of evolution, but their more exact affinities are regarded as very doubtful.

Dr. George F. Kunz's new book *Ivory and the Elephant* includes a very full and interesting compilation of what is known concerning fossil proboscideans and the evolutionary history of the order, especially as to recent discoveries and opinions relating thereto.

The discovery of Eocene mammalia in Burma by Pilgrim and Cotter (*Records Geol. Surv. India*, xlvii, 42) is of great interest as affording the first direct evidence upon the early Tertiary mammalia of Asia. The bulk of the fauna consists of primitive anthracotheres which may well be regarded as representing the ancestral group from which the ruminants are derived. This confirms the forecasts of Stehlin, Matthew and others as to the place of origin of the ruminants.

H. A. Anthony's discovery of numerous well preserved fossil mammals in cave deposits in Porto Rico (*Ann. N. Y. Acad. Sci.*, xxvii, 193; Allen, J. A., *ibid.*, 17) is of remarkable interest. The fauna thus far found consists of a small ground sloth related to one of the smaller Cuban genera, two or more new genera of rodents rather distantly related to the South American hystricomorphs, and an insectivore of a wholly new family, very remotely related to the continental forms, besides bats, birds and lizards not yet studied. This evidence when carefully weighed will have an important bearing on the former geographic relations of Porto Rico to other West Indian islands and to the mainland. As far as appears at present, it indicates a prolonged isolation and the ultimate derivation of the fauna rather from Central America by way of Cuba than from South America by way of the Lesser Antilles; certainly not from North America. But it seems doubtful whether any former continental connection is indicated, the mammalian fauna like that of Cuba, etc., being limited to a few groups which can be accounted for in other ways.

E. L. Troxell (*Am. Jour. Sci.*, xlii, 335) describes the skeleton of a Pliocene horse which is in many respects intermediate between the three-toed horses of the Miocene and the true *Equus* of the Pleistocene. It is referred to the genus *Pliohippus* but is much more complete and more truly intermediate in character than the type species described many years ago by Marsh. A second and more complete skeleton has recently been discovered in Western Nebraska; both are in the American Museum in New York.

A preliminary notice of a nearly complete skeleton of a gigantic fossil bird of the Lower Eocene appears in the *American Museum Journal* for November. It was a contemporary of the well known four-toed horse *Eohippus* and comes from the same formation in Wyoming. It equalled the moas of New Zealand in bulk but had a gigantic head with enormous compressed beak like the South American fossil bird *Phororhachos*.

XXVI. ANTHROPOLOGY, ETHNOLOGY, PSYCHOLOGY, AND PHILOSOPHY

ANTHROPOLOGY AND ETHNOLOGY

GEORGE GRANT MACCURDY

Fossil Man.—Our ideas concerning *Eoanthropus dawsoni*, or the Man of Piltdown, have undergone a change during the year 1916. Dr. Smith Woodward's studies (*A. Y. B.*, 1913, p. 691; 1914, p. 660) were based on the assumption that the Sussex cranium and lower jaw belonged together, although he recognized the resemblance of the latter to that of a chimpanzee. Thus was he impelled to regard the combination as the type of a new genus of the family Hominidae, to which he gave the name *Eoanthropus*. From the start, however, there were not lacking those who hesitated to accept the cranium and mandible as belonging to the same individual. Dr. Woodward's restoration of *Eoanthropus dawsoni* served further to crystallize opinion against the acceptance of his views in the absence of additional confirmatory evidence.

That these two parts never were intended for each other seems to have been clearly demonstrated by Dr. G. S. Miller (*Smithson. Misc. Colls.*, lxv, no. 12, Nov, 1915), who has compared the cast of the Piltdown mandible with casts of chimpanzee mandibles mutilated in the same manner and finds not only similarity but absolute identity. I have examined the material on which Dr. Miller bases his conclusions and have come to the same conclusion (*Science*, Feb. 18, 1916). This view is held likewise by Dr. W. D. Matthew; and by Dr. W. King Gregory, who in a "Note on the Molar Teeth of the Piltdown Mandible" (*Amer. Anthr.*, N. S., 18, July-Sept., 1916) concludes that Miller is "fully justified in holding that the lower molars of the Piltdown jaw are those of a chimpanzee and not those of an extinct genus of Hominidae." The cranium of Piltdown, then, is human, as was recognized by all from the beginning. On the other hand, the lower jaw with its two molars, also the canine tooth found later, are those of a fossil chimpanzee. This means that in place of *Eoanthropus dawsoni*, we have two individuals belonging to different genera, *Homo dawsoni* and *Troglodytes dawsoni* or *Pan vetus*. Such a revision does not by any means minimize the importance of the Piltdown discovery. Rather does it contribute to our knowledge of the fossil fauna of the period in question by the addition of the chimpanzee to the list.

Antiquity of Man in Florida.—The apparent association of human remains and artifacts with animal remains in Pleistocene deposits is always sufficient to challenge the attention of scientists. This is especially true of the New World, where Pleistocene man has not yet won a place in the prehistoric hall of fame. Hence the wide interest taken in the announcement by Dr. E. H. Sellards (Fla. State Geol. Surv., Eighth Annual Report, 1916, 121) that he had found such an association at Vero, Fla. As one of five invited to a conference at Vero during the last week in October, 1916, it has been my privilege to make a special report on the archæological evidence of man's antiquity there gathered.

In both banks of a drainage canal one-half mile north of the village of Vero, three deposits are seen in section: at the bottom a marine shell marl; then a fresh water deposit of sand, muck and marl containing fossil plant, animal, and human remains and artifacts; lastly, at the top, an alluvial bed of incoherent sand and muck, in which there is an abundance of vegetal material, also fossil ani-

mal and human skeletal remains, as well as many artifacts, including flint arrowheads, bone points and ornaments, and potsherds.

The site is at the junction of two streams coming from opposite directions to form a larger stream, in the bed of which the drainage canal has been constructed. To summarize the cultural evidence of man's antiquity at Vero, one may say that the pottery, bone implements, including fishhooks, bone beads and flint arrowheads from stratum 3, points to a period that might well have continued down to the close of the prehistoric period in Florida, i. e., till the coming of the European. The same is true also of the human bones from this stratum. On the other hand, of the 25 fossil mammalian (not including man) remains found in the middle layer (stratum 2), ten, including *Elephas, Mastodon,* the horse, and the tapir recur in the top layer (stratum 3). If the stratigraphy is not misleading, the conclusion is either that this particular phase of the neolithic period in America dates back farther than many had supposed, or else that certain fossil mammals continued to live in Florida until a comparatively recent date.

The chief interest centers in the second stratum. From it a few spalls but no undoubted flint implements have been reported thus far. Although probably produced through human agency, these spalls do not differ from those occurring in the stratum above. While a greater number of bone implements have been taken from the third deposit than from the second, bone points of the same type occur in both; neither do these seem to differ in their chemical state. Potsherds, fairly frequent in stratum 3, have not yet been reported from the stratum below. Of the human skeletal remains there is no difference between those from the second and those from the third; neither do either differ from the Indian bones found in the sand mounds of Florida.

There are to be noted the absence of well defined flint artifacts and of pottery from stratum 2, the presence of both in stratum 3; the similarity of the flint chips in the two deposits; the similarity of the bone points in both deposits; and the greater number and variety of bone artifacts, including ornaments, in the third stratum. Thus, in the absence of stratigraphy as a guide, of all the human and cultural remains reported from the second stratum, none would seem out of place in stratum 3. The presence of plant stems, acorn cups and pieces of wood in the second stratum, although by no means so abundant as in the third stratum, nevertheless gives to it an aspect of comparative newness. Some of the leaves in the muck at the base of the third stratum look as if they might have been buried only a few years ago.

From observations made on the spot and a study of specimens sent to New Haven, my opinion is that the human skeletal remains, flint chips and artifacts for the most part probably found their way to this meeting place of waters through the same (or similar) agencies as did the various animal and plant remains; and there has been more or less dovetailing of the two deposits, because of the peculiar location of the site at the junction of two streams coming from opposite directions. If these premises be true, it would be hazardous to attribute any great antiquity to even the oldest human and cultural remains from Vero. It would be more logical to assume that some of the extinct forms found in the second stratum are perhaps derived from an older deposit; that others lived on in that southern clime longer than has been supposed hitherto, and that the presence of the Indian hunter had much to do with the final ringing down of the curtain on the drama of their ultimate extinction.

Antiquity of Man in New Jersey.—Recent researches by Dr. E. W. Hawkes, also by Leslie Spier and Drs. C. A. Reeds and Clark Wissler, have brought the question of the antiquity of man in New Jersey once more to the fore. In the Trenton area and elsewhere there seems to be evidence of at least two distinct culture levels: that of the modern Delaware Indians and below it the so-called argillite culture. Dr. Hawkes and Ralph Linton have explored an Indian site near Moorestown, which is believed to throw some light on the comparative

age of these two cultures. Modern Indian implements were found in the humus six inches deep; argillite implements in the center of the next stratum, a layer of yellow sand five to seven feet thick; and at the juncture of the yellow sand with a stratum of white glacial sand were uncovered extensive remains of a ceremonial site, which consists of caches of argillite points and bannerstones grouped in three more or less parallel rows around a great central fire pit. This probably represents the overlapping of a later upon an earlier culture.

The data collected by Spier are from the yellow sand or loam in the vicinity of Trenton. About 2,000 specimens were taken from this layer on the Abbott farm. These are limited to but a few forms and point to a simple culture (pitless hammerstones and chipped stone implements of the arrowhead and large-blade types). In sharp contrast with these are the remains of the Delaware in the surface soil above: pottery, implements of bone, shell, and copper, polished and engraved stone objects, notched and grooved sinkers, pitted as well as pitless hammerstones, arrowheads, and larger chipped blades. While only a few arrowhead forms are found in the yellow loam, there are many types among the Delaware arrowheads. Dr. Wissler has applied statistical methods to the mode of occurrence of the argillite culture and concludes that the yellow loam is not a wind deposit but an alluvial deposit.

Canada.—The disaster which overtook the Canadian Arctic Expedition, 1913-16, at the beginning of its career, when the *Karluk* was carried away in the drifting ice (*A. Y. B.*, 1914, pp. 610, 662; 1915, pp. 609, 658), left but one ethnologist to do the work for which two had originally been appointed. Consequently, instead of confining his attention to the archeology, technology, and physical anthropology of the Arctic Eskimo, D. Jenness, the ethnologist, found it necessary to take up also their language and sociology. (See also XXIII, *Exploration.*)

For the archeologist the country of the Copper Eskimo is barren ground. The people are migratory, with no permanent habitations; their winter settlements are merely assemblages of snow huts that melt and disappear in spring; in summer they live in tents of seal or caribou skin, of which no traces remain save rings of stones which anchored down their edges. The dead are laid out on the surface of the ground and the remains scattered or destroyed by the ravages of the seasons and by the depredations of the ravens and the foxes.

On the Arctic coast of Alaska the case was different. There the natives build permanent homes of wood, and bury their dead beneath piles of logs. The ruins of their settlements can be found all along the shore. Extensive excavations were made at Barter Island on the sites of three ancient settlements and a large number of ethnographical specimens unearthed, which throw a flood of light on the condition of the Eskimo in this region long before the earliest explorers came to visit its shores. When the expedition was returning south, further archeological specimens were purchased at Barrow and Point Hope; it will be interesting to compare these with the specimens from Barter Island. In those early days iron was unknown; all weapons were pointed with horn, bone or ivory, with flint, slate or, more rarely, jade. The two most important pursuits of the natives were whaling and caribou hunting. Pipes and fishnets had not then been introduced; labrets were found, but whether any occurred in the ruins that appeared oldest at Barter Island has not yet been determined. Fragments of pottery were numerous; in fact the knowledge of how it was made still persists amongst the Eskimo of this region.

The anthropometrical instruments which were lost on the *Karluk* could not be replaced until 1914. Some 130 Copper Eskimo, all adults, were measured, and descriptions taken of the character of the hair, eyes, cheekbones, etc. Most of this work was done in the snow huts during the winter months, when the scattered bands congregate together on the sea ice. In consequence, apart from the stature, body measurements were unobtainable. Nothing was observed which would indicate fusion with any other race, save that in two or three in-

stances the features seemed to have a somewhat Indian cast. Light coloration in the eyes and beard which was noticeable in certain individuals seemed due entirely to secondary causes. A large number of photographs illustrating the physical features of the natives were taken.

Special attention was paid to the material culture of the Copper Eskimo and a large collection made of their weapons, household utensils, and clothing. These are being changed rapidly through the influence of the western Eskimo and of the whites. Already the natives have an abundance of iron to replace their copper, rifles are beginning to supersede bows and arrows, European pots and tin cans take the place of stone pots, garments of cloth are in great demand, and even the style of the clothing is undergoing change.

Although the time spent amongst the Alaskan Eskimo was very brief, more success was attained in the study of their dialect than in that of the Copper Eskimo. A few folklore stories were written down in the native tongue, and a grammar worked out in considerable detail, accompanied by a small vocabulary. Among the Copper Eskimo, where no interpreter was available who possessed a knowledge of the dialect, the notes on grammatical structure are far less complete. Here, however, a large number of native songs, both the ordinary dance songs and magic incantations, were recorded on a phonograph, and all these have been transcribed and translated.

The Copper-Eskimo dialect would appear to be more akin to the dialect of the Mackenzie River natives than to that of Labrador; but as in Baffin Land, among the Copper Eskimo there is a constant employment of nasal terminations instead of the proper grammatical ending. Another peculiarity of the Copper dialect is the continual substitution of the subjunctive mood for the simple indicative. A number of Alaskan folklore stories were obtained in English and a lesser number from Coronation Gulf. It would appear that not only is the material culture of the Copper Eskimo much simpler than that of the western natives, but their mythology and folklore also are much less varied and complete. It is not merely that the actual number of the legends known to the natives is less, but even those which are known seem often but the surviving fragments of others which are recorded in more complete form elsewhere.

Much information was obtained concerning the daily life of the natives in summer and winter, partly by direct inquiries but mainly by living in their midst, observing and taking part in the common routine. Much misapprehension has existed amongst ethnologists concerning their summer life, our knowledge of which hitherto has depended entirely on the statements of travellers who have come into momentary contact with them during their wanderings. Mr. Jenness spent seven months from early spring till the beginning of the ensuing winter with a small band of natives on Victoria Land, sharing their life in all its details, living in the same tents, hunting and fishing with them to obtain food, and accompanying them in all their movements. The information thus acquired proved beyond doubt that the old theories concerning their social and religious life during this period are entirely erroneous, at least as far as this branch of the Eskimo race is concerned. While it is difficult, perhaps impossible, for a civilized person fully to understand the mental attitude of a savage people towards the phenomena of life, yet the many shamanistic performances which Jenness witnessed and in many cases took part in, leave a general notion concerning their religious life which cannot be far from the truth. Broadly speaking, just as in Hudson Bay, a distinction is made between denizens of the sea and of the land, which is revealed in practice in the form of taboos. But the distinction is by no means rigid, and many game taboos seem to be entirely independent, in some cases even contradictory.

The folklore of the French Canadians of the lower St. Lawrence region has been gathered by C. M. Barbeau. Some of the texts are long and many of them are thought to be of considerable antiquity, going back in certain cases to mediæval oral sources.

The material culture of the Ojibwa Indians of Ontario has been the subject of special research by Mr. Waugh, another of the associates of Dr. E. Sapir, ethnologist of the Canadian Geological Survey.

New York.—The activities of the New York State Museum in anthropological lines are divided into those of research, excavation, museum arrangement, and public instruction. During the year the archeologist and ethnologist has made a detailed study of comparative archeology in New York and has brought together the material for a memoir on the archeological history of New York. A bulletin on the "Constitution of the Five Nations" appeared in print in April.

The Archeological Museum has been finally installed and 100,000 specimens are available for study. More than 10,000 are arranged in cases for general exposition purposes. The plan has been to arrange these New York specimens (1) by localities, (2) in comparative groups, (3) according to the uses, and (4) by methods of manufacture. Special attention has been devoted to methods and to the most efficient system of displaying the specimens, care having been taken to give each exhibit a teaching value readily appreciated by the visitor.

The ethnological groups which have been under preparation for some time have been completed and opened to exhibition. These groups depict, respectively, the hunting, military, council, ceremonial, industrial and agricultural activities of the Iroquois. The figures in each group are life casts, and the background paintings, which are 50 ft. in length, are reproductions of historic spots in the Iroquois country. The field survey during the year has been conducted to determine the area occupied and influenced by mound-builder culture and also to determine the pre-Iroquoian occupation. Special attention has been given to the Genesee Valley and the adjacent Finger Lakes. Some work has been done also along the Hudson, especially the upper waters, resulting in the acquisition of some 3,000 specimens. The archeologist of the Museum received the biennial award of the Cornplanter medal for Iroquois research given by the Cayuga County Historical Society.

During the year the archeologist instituted the New York State Archeological Association, which is designed to bring together the amateur archeologists of the state in chapters, the locations of which are to be in all the larger cities of the state. The success of this movement has been so marked that the Lewis H. Morgan Chapter of Rochester alone has a membership of more than 100.

Susquehanna Valley.—On May 16 W. K. Moorehead and A. B. Skinner started from Lake Otsego, the head of the Susquehanna River, with an expedition of nine men. About June 12 the party was joined by Rev. George P. Donehoo, representing the Historical Commission of the State of Pennsylvania, and the party proceeded down the river to Havre-de-Grace, Md. Three hundred and seventy miles was traversed in canoes and small boats. A total of 2,000 specimens and 57 skeletons were secured and sent to the Museum of the American Indian, New York City. Nearly all the sites were mapped and an arrangement was entered into with the state of Pennsylvania whereby the work will be continued through two or three seasons.

A stone carving of great interest was found at Harpursville, N. Y. It is in the form of a human face, and probably represents a mask, similar to certain types still in use among the Iroquois. At Athens, Pa., a cemetery of Andaste culture was discovered and 57 skeletons were found, together with some whole pottery and pipes representing Andaste culture. From the source of the river as far down as the Wyoming Valley, the village sites seem to indicate historic rather than prehistoric occupation. On Mountain Island, in the lower Susquehanna, a place was found where the aborigines had manufactured banner stones; many of these objects were found and a thorough search failed to reveal other forms in stone. The expedition did not have time to explore the West Branch of the Susquehanna, but a hasty examination of it seems to indicate that Indian sites are far more numerous on the West Branch than on the East or North Branch.

Mississippi Valley.—The examination by William C. Mills of the great mounds and village site five miles north of Portsmouth, Ohio, known as the Fuert mounds and village site, resulted in the gathering of interesting information and the addition to the museum of the Ohio Archæological and Historical Society of over 400 more or less complete Indian skeletons and some 6,000 artifacts. The collection is especially rich in bone implements, the number of bone awls alone amounting to 1,280. Some 40 pipes were found.

These mounds and the village site were examined for the purpose of ascertaining if there had been any connection between this group and the peoples who built the Tremper mound (*A. Y. B.*, 1915, p. 660), which is situated across the river some two and one-half miles away. Pipestone was employed alike at both places, and Mr. Mills was so fortunate as to discover the quarries from which the pipestone was taken.

Clarence B. Moore has explored many aboriginal sites on Green River, Ky.; on the lower Ohio River in the states of Illinois, Indiana, and Kentucky; and along the Mississippi River in Missouri, Kentucky, and Tennessee. The results have just appeared (*Jour. Acad. Nat. Sci. of Philadelphia*, xvi, 1916).

M. R. Harrington of the Museum of the American Indian has explored mounds and cemeteries near Ozan and Washington, both in Hempstead County, Ark. Much ancient pottery, some of it representing new forms, was obtained.

Plains Indians.—Dr. A. Hrdlicka of the National Museum has determined the anthropological status of the different bands of the Sioux. The main object of his expedition, however, was the determination of the blood status of approximately 800 Chippewa Indians for the U. S. Department of Justice.

Dr. Robert H. Lowie of the American Museum of Natural History has practically completed the collection of myths of the Crow Indians of Montana. He has visited also the Arapaho of Wyoming in order to secure additional information concerning their ceremonial organization.

The Southwest.—N. C. Nelson, whose important contributions to the chronology of the ceramic products of the Southwest was noted in the last issue of the YEAR BOOK (p. 662), is again in the field for the purpose of determining the geographical limits of the distribution of the glazed pottery. A survey of the ruins in the Zuñi Valley has been made by Leslie Spier for the purpose of obtaining stratigraphic information that would be of service in determining the chronology of the ruins in the Zuñi district. The main feature of Dr. P. E. Goddard's field work for the American Museum of Natural History was a study of the clan organization and terms of relationship among the Apache Indians of the White Mountain Reservation in Arizona. In order to facilitate this study, a census of the adults of the tribe was taken, in which names, clan affiliations and blood relationships were recorded. Dr. Lowie has continued his study of the social organization and ceremonials of the Hopi Indians; he witnessed two of the snake dances in the villages of Oraibi and Shungopavi, as well as the flute ceremony, performed in 1916 at Walpi.

S. J. Guernsey, representing the Peabody Museum of Harvard University, has explored the sites of the so-called "Basketmakers" in northern Arizona, securing a large amount of material, including many mummies. Neil M. Judd of the U. S. National Museum has continued field work in western Utah. As a result, it is now possible to extend the northern limits of the ancient Pueblo area, and to say with certainty that the house remains of western Utah represent a vast prehistoric population closely related, culturally at least, to the well known cliff-dwelling and house-building peoples of Arizona and New Mexico.

The Department of Archæology of Phillips Academy, Andover, has carried on field work at the pueblo of Pecos and in Texas under the direction of Drs. Charles Peabody and A. V. Kidder. Important archeological collections were obtained at Pecos, where it is planned to continue the work for several seasons.

An expedition from the Commercial Museum, Philadelphia, in charge of Mrs. L. L. W. Wilson, has brought back from the ruins of Otowi, N. M., some interesting data as well as valuable collections.

Central America and the West Indies.—Prof. Marshall H. Saville has completed a reconnaissance trip in Costa Rica and the Talamanca province close to the frontier of Panama. The trip was in the nature of a preparation for excavations in the eastern part of the region, where deep graves with large sculptured slabs had been found. By a further study of the ancient pottery of the province of Chiriqui, Panama, the writer has discovered new evidence as to the manner in which ornamental designs have arisen. He finds the association of a given animal with a given kind of ceramic product; also the proliferation of a whole series of decorative motives grouped about a single animal form and derived from it. The ceramic group under consideration, the so-called "lost-color" ware, is found to be completely dominated by decorative motives derived from the octopus.

On the island of Santo Domingo Theodoor de Booy has opened a prehistoric cemetery containing many burials. With each burial were from one to several pottery vessels, most of which were decorated with incised patterns. From a cave on the same island he obtained a large human effigy figure of clay representing a hunchback in a sitting posture. Mr. de Booy visited also the island of Martinique and the Danish West Indies in the interest of the Museum of the American Indian. For the same Museum, Rev. Thomas Huckerby has continued explorations previously begun in Trinidad, Grenada, Tobago, St. Vincent, and the Grenadines. Through his efforts many new forms have been added to the collections from these islands.

After an absence of three years, Dr. William C. Farabee, in charge of the University of Pennsylvania Expedition to the Amazon region, has returned with results of special importance to the science of anthropology. The first trip was made to the Campo, or great grassy highlands of northern Brazil and southern British Guiana. Crossing into Brazilian territory again, the party traveled south almost to the Equator, then east and north, finally passing over the divide to the Courantyne, which they descended to its mouth. Some of the tribes encountered had never before seen white men and were unacquainted with matches, guns, clothing, etc. The second journey was made up the Amazon some 3,000 miles into Peru, and large collections were gathered among the Conebo, Shipbo, Cocama, and Yahua tribes. The Conebo are the noted pottery makers of the Amazon. The third trip was up the Purus and Yacu Rivers; while the fourth was up the Tapajos River to the frontier of the state of Matto Grosso. Many villages of the Mundurucus, the largest tribe in northern Brazil, were visited and much valuable material secured, especially with reference to their language and mythology. It is hoped that this data will settle definitely the relation of the Mundurucus to the Tupi. The last journey was to the Apallaii on the Paru and Jary, and the Paikipirangas on the upper Maraca. They are on the north side of the lower Amazon. Some splendid feather work is still done by the Apallaii.

In addition to valuable ethnological work among some 30 tribes, important archeological excavations were carried out in many places along the Amazon and on the islands near its mouth. There are many ancient mounds on Marajo, the large island in the mouth of the Amazon. Several of these were excavated, the largest of which measured 600 ft. long and 20 ft. high. A great quantity of pottery was found but no metal or flint implements and only a few implements of stone. It is gratifying to note that no misunderstandings marred the pleasure or progress of the expedition; this was due largely to the friendly interest of and most valuable assistance rendered by the Brazilian Government, the different state governments, the steamship companies, museum authorities, officials, and common people everywhere.

Prof. M. H. Saville of the Museum of the American Indian spent part of 1916 in explorations along the Pa-

cific coast in the region between Tumaco in Colombia and the frontier of Ecuador, special attention being given to the Mira and Mataje valleys. The material excavated supplements that collected by him several years ago in the region of La Tolita and from the mounds near Tumaco. Of peculiar interest are the numerous specimens of red painted ware. Professor Saville's researches were extended to the northern coast of British Guiana; also to the Lesser Antilles, where he worked jointly with Mr. Huckerby.

An archeological reconnaissance of Venezuela under the direction of Dr. Herbert J. Spinden was undertaken early in the year by the American Museum of Natural History. Later Dr. Spinden made a survey of the important archeological sites of Porto Rico for the New York Academy of Sciences. Particular attention was given to a study of private collections, as well as to petroglyphs and shell heaps; two of the latter were excavated and evidences of stratification noted.

International Congresses.—The coming of the Second Pan-American Scientific Congress, with its Section of Anthropology, to Washington, at the close of 1915 and the beginning of 1916, was thought to be a fit time for the holding of the nineteenth International Congress of Americanists (Anthropologists), due to have been held at Washington in October, 1914, but delayed on account of the European War. By virtue of this combination and the affiliation of other anthropological societies, the attendance was large and the programme unusually long. Nearly 100 papers were read, a large majority of these being presented through the International Congress of Americanists.

Teaching of Anthropology and Ethnology in American Institutions.—In order to determine to what extent instruction is being offered in the general field of anthropology in the United States, the writer sent a circular letter to 195 institutions. This list did not include Harvard, Yale, Columbia, the Universities of Pennsylvania, Chicago, and California and Phillips Academy at Andover, where more or less well organized departments of anthropology are known to exist; neither did it include purely technical schools, nor academic institutions in which the faculty consisted of fewer than 30 members. Of the 195 institutions in question, 36 offer instruction in some branch of the subject, 124 do not, and 35 failed to reply to the inquiry.

Two striking facts revealed by this inquiry are the lack of interest in the subject still shown by a few leading universities such as Cornell and Johns Hopkins, and the addition of anthropological courses to the curricula of some of the lesser colleges, but more especially to those of the state universities, where the signs of growth in interest are both steady and unmistakable. The fact that the state of Utah is contributing $2,000 annually to the archeological department of its University for purposes of research within the state is most reassuring and a splendid example for other states to follow.

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PSYCHOLOGY

HERBERT SIDNEY LANGFELD

General and Theoretical.—Owing to the increase in experimental investigations, a new paper, the *Journal of Experimental Psychology*, has been started and the *Psychological Review* now prints only theoretical articles. E. B. Titchener's interest in the application of psychology to anthropology has led him to criticise the results of the Cambridge Anthropological Expedition to the Torres Straits. Among other things he pleads for a closer coöperation between the field workers and the psychological laboratory ("On Ethnological Tests of Sensation and Perception with Special Reference to Tests of Color Vision and Tactile Discrimination, etc.," Proc. Am. Philos. Soc., LV, No. 3, 1916). H. L. Hollingworth takes exception to the distinction between primary and secondary qualities in sensation and affirms that there is no gulf between the material or physical and the mental order of events. (*Jour. of Philos., Psych. and Scientific Methods*, March 30, 1916.) After criticising the facts and theories of recent investigations upon the emotions, especially the work of W. Cannon, J. R. Angell concludes that the root of James's theory remains essentially untouched, notwithstanding the attacks made upon it (*Psych. Rev.*, July, 1916).

H. K. Haberlin in "The Theoretical Foundations of Wundt's Folk-Psychology" (*ibid.*) takes exception to Wundt's distinction between history and psychology. E. B. Titchener discusses at some length the old question as to whether black is a sensation and, in opposition to J. Ward, answers it in the affirmative (*Jour. of Philos., Psych., and Scientific Methods*, March 2, 1916).

Experimental Human Psychology.—There has been normal progress in experimental psychology during the year, and one does not notice an over emphasis in any one field unless it be in the development of mentality tests. There have been several papers upon method. S. W. Fernberger, in a paper entitled "The Effects of Practice in its Initial Stages in Lifted-Weight Experiments and its Bearing upon Anthropometric Measurements" (*Am. Jour. of Psych.*, April, 1916), states that owing to practice effect at least 50 judgments should be made on each pair of stimuli. E. G. Boring makes further suggestions relative to this subject (*ibid.*, July 1916). E. J. G. Bradford states in an article upon the "Measures of Variability" (*ibid.*, Apl., 1916) that the average deviation is not a measure of variability but of probability. C. E. Ferree and G. Rand describe "A New Method of Heterochromatic Photometry" (*Jour. of Exper. Psych.*, Feb., 1916). L. Dooley has adopted a new point of view in the application of the association method. Hitherto the method was used to discover individual complexes. Her principal interest is to seek the common complexes occurring in different observers. (*Am. Jour. of Psych.*, Jan., 1916.) Several new instruments and their application have been described. A. J. Brown suggests "Some Uses of Artificial Daylight in the Psychological Laboratory" (*ibid.*, July, 1916). C. E. Ferree and G. Rand have described "A Spectroscopic Apparatus for the Investigation of the Color Sensitivity of the Retina, Central and Peripheral" (*ibid.*, June, 1916) and "A Simple Daylight Photometer" (*Am. Jour. of Psych.*, July, 1916). W. F. Dearborn and H. S. Langfeld have described a "Portable Tachistoscope and Memory Apparatus" and suggested methods for its use (*Psych. Rev.*, Sept., 1916). H. S. Langfeld has described a "Portable Self-Registering Tapping-Board and Counter" (*ibid.*). One of the most important papers upon problems of sensation is that of E. K. Boring upon "Cutaneous Sensations after Nerve-Division" (*Quart. Jour. of Exper. Physiol.*, X, No. 1, 1916). Boring has repeated Head's experiments and has obtained results to some extent at variance with his. He also takes exception to Head's theoretical conclusions. E. M. Alspach has tested experimentally the assertion of Brentano that one sees blue and yellow in green. He finds green as well as intermediate colors to be simple in character (*Am. Jour. of Psych.*, April,

1916). P. F. Swindle has found that there is a secondary after-image of very long duration and he believes this phenomenon offers an explanation for the ghosts of the spiritualists (*ibid.*, July, 1916). G. J. Rich in "A Preliminary Study of Tonal Volume" states that judgments of tonal volume are easily made and readily distinguished from those of pitch. The thresholds obtained for tonal volume differ from those obtained for pitch (*Jour. of Exper. Psych.*, Feb., 1916). An interesting experiment upon attention is that of H. Woodrow entitled "Outline as a Condition of Attention" (*ibid.*, Feb., 1916). He investigated the degrees of attention by a strictly objective method and found that his results agree with those obtained by the introspective method. J. J. B. Morgan's investigation of work under distraction corroborates to some extent previous work (*Arch. of Psych.*, Feb., 1916). He finds that although there is an initial decrease in speed due to a noise distraction, there is following this an increase. The subject exerts an extra effort to overcome the effect of the noise as indicated by extra pressure on the reaction key and changes in breathing. This increase in energy is a better measure of the effect of distraction than the change in speed. As was found last year a number of papers have appeared upon memory. D. O. Lyon has investigated "The Relation of Quickness of Learning to Retentiveness" (*ibid.*, Jan., 1916). F. P. Boswell and W. S. Foster have worked "On Memorizing with the Intention Permanently to Retain" (*Am. Jour. of Psych.*, July, 1916), and found this attitude helpful in learning a vocabulary. M. H. and E. K. Strong investigated "The Nature of Recognition Memory and of the Localization of Recognitions" (*ibid.*, July, 1916). They found that the ability to localize memories fades out more rapidly than the ability to recognize. The learning process has been studied by M. C. Gould and F. A. C. Perrin. They find that their method affords opportunity of comparing the learning process of human subjects with that of animals, but they suggest a more critical study of the significances of the results (*Jour. of Exper. Psych.*, April, 1916). J. C. Barnes has described the "Voluntary Isolation of Control in a Natural Muscle Group" (*Psych. Monogr.*, No. 93, Aug., 1916). He relies extensively upon introspection. In an introspective study of the time sense J. N. Curtis substantiates the theory held, among others, by E. B. Titchener that duration is an inherent aspect or attribute of sensations (*Am. Jour. of Psych.*, Jan., 1916). In an investigation upon "Factors which Influence the Arousal of the Primary Visual Memory Image" (*ibid.*, Jan., 1916), H. E. Burtt found that visual mental images were reënforced by complexity of contour, size, length of exposure and motor reinforcement of the original stimulus and diminished by motor and mental distraction. A. Feleky has employed interesting methods in her work upon "The Influence of the Emotions on Respiration" (*Jour. of Exper. Psych.*, June, 1916). In laughter the time for inspiration is less than the time for expiration. This is also the habitual relation. In disgust, pleasure, anger, pain, wonder and fear the reverse relation exists. In an experimental work upon "The Tridimensional Theory of Feeling from the Standpoint of Typical Experiences" (*Am. Jour. of Psych.*, April, 1916) W. S. Foster and K. Roese find no evidence to support this theory of Wundt. W. Brown has investigated the effect of suggestion upon the limen of sensations, upon memory, illusions, etc., from the point of view of sex difference. Women are less consistent from test to test and show less individuality in their form of suggestibility than men. (*Univ. of Calif. Publ. in Psych.*, July 11, 1916.) An interesting investigation with the use of tests is that of G. O. Ferguson on "The Psychology of the Negro" (*Arch. of Psych.*, April, 1916). He has tested many negroes from various parts of the country and a number of whites for comparison. He estimates that the negro is 75 per cent. as efficient in higher mental ability as the white man. This does not hold for all classes of negroes. "It is probably correct to say that pure negroes, negroes three-fourths pure, mulattoes and quadroons have, roughly, 60, 70, 80, and 90 per cent., respectively, of white intellectual efficiency."

Abnormal Psychology.— Mention was made in the YEAR BOOK for 1915 (p. 670) of the active interest of criminologists in psychology. This continues, as is shown by the establishment of a psychopathic research department at Sing Sing Prison under Dr. B. Glueck and a psychological laboratory under Dr. V. V. Anderson for the Boston police courts. A new *Journal of Delinquency* has been started. T. H. Haines has several papers on the point-scale. One of them is entitled "Relative Values of Point-Scale and Year-Scale Measurements of One Thousand Minor Delinquents" (*Jour. of Exper. Psych.*, Feb., 1916). He finds that the Binet-Simon scale through uncritical application classifies too many as feeble-minded. The point-scale is by comparison a much finer means of measurement. S. I. Franz reports "On Certain Fluctuations in Cerebral Function in Aphasics" (*Jour. of Exper. Psych.*, Aug., 1916). He concludes that the manner of cerebral activities is less machine-like than is generally supposed. Freudian literature continues to appear. C. G. Jung's book *Psychology of the Unconscious* has been translated by B. M. Hinkle (Moffat, Yard). An author opposed to the Freudian conception of sexuality is Meyer Solomon, who criticises Freud in a review of "The Psychopathology of Everyday Life" (*Jour. of Abnormal Psych.*, April-May, 1916). L. Dooley in "Psychoanalytic Studies of Genius" (*Am. Jour. of Psych.*, July, 1916) presents a *résumé* of various articles upon the Freudian analysis of genius. E. E. Southard's remarks "On Descriptive Analysis of Manifest Delusions from the Subject's Point of View" (*Jour. of Abnormal Psych.*, Aug.-Sept., 1916) are in line with his theory of grammatical categories as applied to an analysis of delusions. In "A Marked Case of Double Inversion" (*Am. Jour. of Psych.*, April, 1916) G. F. Arps reports the results of tests upon a boy of questionable ancestry, who doubly inverts the words he writes. J. K. Fuller has written a thesis upon "The Psychology and Physiology of Mirror-Writing" (*Univ. of Calif. Publ. in Psych.*, May 8, 1916). Prince's insistence upon a knowledge of the subconscious is well known. In "The Subconscious Settings of Ideas in Relation to the Pathology of the Psycho-Neuroses" (*Jour. of Abnormal Psych.*, April-May, 1916) he again emphasizes the importance of a study of the subconscious for psychiatry. Another case of multiple personality has been reported—this time quintuple personality, by W. F. Prince ("The Doris Case of Quintuple Personality," *ibid.*, June-July, 1916). An important addition to the literature of dreams is that of Havelock Ellis, *The World of Dreams* (Houghton, Mifflin).

Animal Psychology.—In a monograph entitled *The Mental Life of Monkeys and Apes: A Study of Ideational Behavior* (Holt), R. M. Yerkes has published the results of investigations he made in 1915 at Montecito, Cal., upon the anthropoid ape. The paper aims not only to present new facts concerning the ape, but to arouse interest in the establishment of a permanent station for a thorough study of these animals. K. S. Lashley has continued his work upon vision at Johns Hopkins and presents a paper on the spectrum of the domestic fowl (*Jour. of Animal Behavior*, Jan.-Feb., 1916). He finds that the fowl is sensitive to differences of wave length irrespective of intensity. He shows the bearing of his results on our knowledge of human vision. R. M. Johnson reports in three papers further work on the "Visual Pattern-Discrimination in the Vertebrates." Two are upon the width of visible striae for the monkey and the chick and one on "The Dog's Deficiency in Detail-Vision" (*ibid.*, May-June, 1916). The reactions of an animal of primitive structure, that of the mud puppy of the fresh waters of North America, have been studied by M. H. Sayle (*ibid.*, March-April, 1916). H. E. Burtt has published "A Study of the Behavior of the White Rat by the Multiple Choice Method" (*ibid.*, May-June, 1916).

Educational Psychology.—One of the best books of the year on educational psychology is J. M. Terman's *Measurement of Intelligence* (Houghton, Mifflin). It contains a revision of the Binet-Simon tests based upon 1,000 cases, general theoretical discussions and findings on distribution

of mental traits and their variability, and on sex differences. F. N. Freeman's *The Psychology of the Common Branches* (Houghton, Mifflin) attempts to bring together elementary psychological facts concerning arithmetic, reading, writing, geography, drawing, teaching of foreign languages, and history. A clear idea of the opinion of a number of psychologists in regard to the value of mentality tests and the way in which they should be developed may be obtained from a glance at the symposium on this subject that has appeared in the April, May and June numbers of the *Journal of Educational Psychology*. This *Journal* also contains a number of papers describing various mentality tests. In the March number, W. V. Bingham in an article entitled "Some Norms of Dartmouth Freshmen" gives the results of an extensive series of tests upon college freshmen. The title of the paper by A. I. Gates, "Variations in Efficiency During the Day, Together with Practise Effects, Sex Differences, and Correlations," explains the nature of his recent investigation (*Univ. of Cal. Publs. in Psych.*, March 16, 1916).

Industrial Psychology.—There is an increasing demand for psychology in vocational guidance. H. L. Hollingworth has just published a practical book on this subject (*Vocational Psychology*, Appletons). The Business Training Corporation of New York has issued the first unit in its course on business essentials entitled "Analyzing Yourself." For the last 15 years C. E. Seashore has had a number of students at work in the psychological laboratory upon the "problem of developing the methods and means of measuring musical talent" ("Vocational Guidance in Music," *Univ. of Iowa Monogr.*, Sept., 1916). H. F. Adams has another paper on advertising. He finds that if exact duplicates are used, increased size has a greater value than increased number of repetition, but variation has a greater value than repetition of the same advertisement (*Jour. of Phil., Psych. and Scientific Methods*, March 16, 1916). E. K. Strong's paper upon "The Factors Affecting a Permanent Impression Developed Through Repetition" (*Jour. of Exper. Psych.*, Aug., 1916) contains some interesting results applicable to the problem of advertising. In "The Effect of Uniform and Non-Uniform Illumination upon Attention and Reaction-Times with Special Reference to Street Illumination" (*Jour. of Exper. Psych.*, April, 1916), H. E. Burtt reports the results of psychological tests made upon variously illuminated New York streets. F. L. Wells in his experiments "On the Psychomotor Mechanisms of Typewriting" (*Am. Jour. of Psych.*, Jan., 1916) finds that the work is in all respects better at noon than at the beginning of the working day. The late Hugo Münsterberg's suggestive book *The Photoplay* (Appletons) contains many interesting psychological, æsthetic and applied facts concerning the motion picture.

PHILOSOPHY

RALPH BARTON PERRY

General Philosophy.—Several distinguished philosophers have passed away since the last issue of the YEAR BOOK. American scholars have learned with especial regret of the deaths of Wilhelm Windelband, the eminent German idealist and historian of philosophy, Alexander T. Ormond, the teacher of many generations of Princeton men, Alfred W. Benn, the distinguished English student of Greek philosophy, and François Pillon, the French thinker to whom William James dedicated his *Principles of Psychology*. But American philosophy suffered a greater loss when Josiah Royce died in Cambridge on Sept. 14. Professor Royce was America's most eminent and revered philosopher. He has been distinguished for many years, and in many fields. He was a profound metaphysician, a successful experimentalist in psychology, a moralist and philosopher of religion to whom many turned for inspiration and guidance, and America's most competent technician in the difficult subjects of mathematical logic and scientific methodology. Still more recently, on Dec. 16, Hugo Münsterberg

died suddenly in the midst of his work, and at the height of his powers. Although the major part of his achievement was in the field of psychology, he was a distinguished philosopher and one of the foremost representatives of the Fichtean school of idealism.

The American Philosophical Association met in Philadelphia in December, 1915. The presidential address, afterwards published in the *Philosophical Review* for March, 1916, was delivered by Prof. A. C. Armstrong. It dealt with "Philosophy and Common Sense," and showed that the philosophical generalizations of one epoch, such as the uniformity of nature, the dualism of mind and body, and evolution, are incorporated into the common sense of the next. Prof. A. O. Lovejoy was elected president for the ensuing year. With a solemn propriety that could not be appreciated at the time, the sessions of the Association were devoted chiefly to papers on Professor Royce's philosophy by his friends and former pupils. These papers have since been published in a single volume as the May number of the *Philosophical Review*. A paper by Professor Dewey dealt with "Voluntarism in the Roycean Philosophy." A group of papers by M. W. Calkins, W. A. Brown, G. P. Adams and B. W. Bacon, dealt with Royce's contributions to religious philosophy. The logical and epistemological aspects of his thought were discussed in W. H. Sheldon's "Error and Unreality," and in other papers by C. I. Lewis, E. G. Spaulding and M. R. Cohen. W. E. Hocking and E. A. Singer contributed studies of his ethics; and interesting biographical papers were contributed by Professor Howison, by Dr. Richard C. Cabot, and by Professor Royce himself in the remarks which he made at a banquet held in his honor. Royce's influence on contemporary scientists was indicated in the papers of E. E. Southard and L. J. Henderson. Dr. Benjamin Rand contributed a valuable bibliography of his works.

Since the death of Royce, Prof. John Dewey remains as the most influential of living American philosophers. His recent scattering essays in epistemology have been published during the year under the title of *Essays in Experimental Logic*. The philosophical world now awaits with interest a volume already announced under the title, *Creative Intelligence* (Holt). This volume is a collection of papers written by thinkers who have been influenced mainly either by Dewey or by William James, and who represent the "instrumentalist" or pragmatist tendency in American philosophy. This field of investigation, the theory of knowledge or epistemology, still attracts the majority of philosophical writers. R. W. Sellars has written a book entitled *Critical Realism* (Rand, McNally), in which he defends a dualistic, naturalistic view of the relation of knowledge to its object, a view similar to that advanced by Külpe, and formerly by Bertrand Russell in his *Problems of Philosophy*. Two articles by H. G. Hartmann, "Science and Epistemology," and "A Revised Conception of Causality" (*Jour. of Philos.*, May 11 and Aug. 31, 1916), are allied with the instrumentalist tendency; and R. B. Perry's "The Truth Problem" (*Jour. of Philos.*, Sept. 14 and Oct. 12, 1916) illustrates the "new realism." The same problems attract attention in England, where the Aristotelian Society continues to be the principal centre of philosophical activity. The presidential address delivered before this Society on Jan. 6 by Lord Haldane, entitled "Progress in Philosophical Research," dealt with the relations of the new realism, and the "new idealism;" while at the meeting of March 6, T. Percy Nunn read a paper on "Sense-data and the Physical Object," in which he defended their identity against the view that the physical object transcends experience. Bergson continues to be widely read and written on in America. Among the books on the subject special mention should be made of G. W. Cunningham's *A Study in the Philosophy of Bergson* (Longmans), in which the author examines the Bergsonian notion of intuition, and likens it to the Hegelian "notion." One of the best special investigations of the year is H. C. Warren's series of articles entitled "A Study of Purpose" (*Jour. of Philos.*, Jan. 6 and 20 and Feb. 3, 1916), in which the author effects a reconciliation of purpose and mechanism. He

rejects the vitalistic conception of a "potent directive agency," but retains purpose in the sense of "anticipation" and "fitness" in the bio-psychological realm, and in the sense of "trend" in the general cosmic process.

Ethics.—Needless to say, the European War has brought about an increased interest in ethics and political philosophy. The meeting of the Western Philosophical Association, held in St. Louis, April 21-22, 1916, was devoted to a discussion of "the state, its meaning, its development, and its possibilities." The topics discussed were summarized in the report of the meeting as follows:

(1) The meaning of individualism and the place of initiative in the Hegelian and other German conceptions of the state; especially, are liberty and progress possible in a state organized as a logically closed system?
(2) Liberty in relation to democracy: what are the guarantees of freedom, and indeed what is the meaning of freedom in a democracy?
(3) The relation of economic and political freedom, and the possibility of adjusting these without disrupting democratic institutions.
(4) The definition of nationality: if race, language, religion, politics, do not make a nation, what is it?

Among the papers read at this meeting which have since been published two are especially deserving of mention. In "Nature, Reason and the Limits of State Authority" (*Philos. Rev.*, Sept., 1916), E. H. Hollands emphasizes the exclusively political function of the state, and urges that the cultural life of the nation should be left to free and private association, as a curb to the state and as a link between nation and nation. "Liberty and the Social System," by G. H. Sabine (*ibid.*), criticizes Bosanquet's conception of the organic unity of society, from the standpoint of liberalism, individualism and experimentalism.

The fourth meeting of the Conference in Legal and Social Philosophy was held at Columbia University, Nov. 26-27, 1915, and produced several interesting papers on the general topic of the relations of law and force. Most of these have since been published. Professor Dewey, in a paper entitled "Force and Coercion" (*Int. Jour. of Ethics*, April, 1916), shows that there is no general formula which applies, but that it is necessary in each case to justify the use of force by the standards of economy and efficiency. H. J. Laski criticized the absolutistic-monistic view of the state in a paper entitled "The Sovereignty of the State" (*Jour. of Philos.*, Feb. 17, 1916), and S. P. Orth contributed a paper on "Law and Force in International Affairs" (*Int. Jour. of Ethics*, April, 1916). M. R. Cohen, who has done much to promote the Conferences in Legal and Social Philosophy, has published in the *International Journal of Ethics* for July a valuable review of "Recent Philosophical-Legal Literature in French, German and Italian," covering 1912 to 1914.

The periodical just mentioned has proved a useful forum for the discussion of the larger ethical questions growing out of the war, and in addition to the papers referred to above, has published valuable discussions of the basis and status of international law, especially with reference to the differences between this country and Germany and England. There have also appeared a number of papers on the problems of sex and marriage. Among these, two are especially worthy of mention. In the July number Bertrand Russell writes on "Marriage and the Population Question." The article attacks the divorce laws of England, and asserts that present opinion and usage results in the virtual sterilization of the better classes. He proposes radical measures of relief, including state aid for mothers. In an article entitled "Birth-control and Biological Ethics" in the October number, Warner Fite denies that there is any obligation to beget and rear large families. Such a supposed obligation rests upon biological, nationalistic or capitalistic reasons which are not cogent since the development and perfecting of the individual is a higher end than the increase of life, national power or wealth. The real argument for marriage and parental responsibility lies in the contribution which these make to the spiritual growth of the individual.

Several theoretical books and articles on ethical topics deserve mention. In a book entitled *The Theory of Abstract Ethics*, Th. Whittaker has attempted a revival of intuitionism. He

finds the maxims of justice and liberty to be ultimate and irreducible. W. M. Urban continues to be the principal American contributor to the important subject of "value." In an article entitled "Value and Existence" (*Jour. of Philos.*, Aug. 17, 1916), he reaches the conclusion that value possesses a unique sort of objectivity, to be distinguished both from being and from non-being. G. C. Cox, in an article entitled "Ethics as Science" (*Jour. of Philos.*, April 13, 1916), pleads for an ethics that shall be empirical and experimental after the manner of the natural sciences. This aim is certainly realized to some extent in the book which attracted the most attention in this field during the last year. In his *Freudian Wish and Its Place in Ethics* (Holt), E. B. Holt has made an extremely interesting and successful application to morals of the most recent results of psychology. The central fact in mind, according to Professor Holt, is the "wish" or purpose or motor set, with its specific responsive tendency to some situation in the environment. The conflict among these wishes creates the moral problem. The solution of the problem is to be found not in the "suppression" or "frustration" of one of the conflicting motives, but in their "integration" into a higher purpose. Professor Holt reaches a new statement, in terms of the psychological conceptions of the day, of the Spencerian doctrine of "natural reactions" and the Socratic dictum that virtue is knowledge.

Logic.—In a book entitled *The Principles of Understanding*, H. Sturt has presented an introduction to logic from the standpoint of "personal idealism." It is an entertaining but somewhat loose discussion of the art of thinking, in terms of a voluntaristic psychology. A. E. Davies has published a fair *Text-book of Logic* (R. G. Adams & Co.). In an article entitled "On Certain Logical Paradoxes" (*Philos. Rev.*, Jan., 1916), Th. De Laguna has criticized Russell's theory of types, and has attempted a solution of the classic contradictions by a re-examination of the nature of the logical copula. H. C. Brown's "Structural Levels in the Scientist's World" (*Jour. of Philos.*, June 22, 1916) makes an interesting contribution to scientific methodology.

History of Philosophy.—Prof. C. E. Vaughan of Leeds has brought out a timely edition of Rousseau's *Political Writings*, with introductions showing Rousseau's socialistic leanings. In a series of articles entitled "The Plot of Plato's *Republic*" (*Mind*, Jan., April and July, 1916), P. S. Burrell has attempted to prove that the *Republic* as a whole has unity, consecutiveness and artistic form. Three other scholarly pieces of historical research should be mentioned: "Kant's View of Metaphysics," by A. A. Bowman (*Mind*, Jan., 1916); *Freedom and Purpose, an Interpretation of the Psychology of Spinoza*, by J. H. Dunham; and "Doctrines of the Self in St. Augustine and in Descartes," by M. W. Kehr (*Phil. Rev.*, July, 1916).

Philosophy of Religion.—The most important recent event in this field is the translation of Durkheim's *Elementary Forms of the Religious Life*. Durkheim's application of primitive sociology to the interpretation of religion has already been widely adopted. Its influence is to be found, for example, in W. K. Wright's "Justice and Sentiment in Religion" (*Phil. Rev.*, Jan. 1916). C. C. J. Webb's *Group Theories of Religion and the Religion of the Individual* (Allen & Unwin) is, on the other hand, a criticism of Durkheim from the more traditional point of view.

XXVII. THE MEDICAL SCIENCES

ANATOMY

G. Carl Huber

Cytology.—Cowdry (*Am. Jour. Anat.*, xix) considers the general functional significance of mitochondria, which he defines as substances occurring in the form of granules, rods and filaments in almost all living cells, reacting positively to janus green and resembling phospholipins and to a lesser extent albumins (see also XXV, *Zoölogy*). Evidence is presented showing that mitochondria play an active *rôle* in cell activity, perhaps on the constructive side of metabolism. They play no clearly demonstrable part in histogenesis and there are at hand no conclusive observations showing that they do or do not play a *rôle* in heredity. In the study of pathologic conditions mitochondria may furnish an index of cytoplasmic activity. Scott (*ibid.*, xx) reports on the behavior of the mitochondria in the pancreas cells in phosphorus poisoning, finding that they are the first constituents of the cytoplasm to show pathologic change. Shipley (*Anat. Rec.*, x) has shown by means of vital staining with janus green that certain granules of trypanosomes are mitochondrial in nature; the kinetonucleus was found to stain like mitochondria. Rasmussen and Myers (*Jour. Comp. Neur.*, xxvi) have studied the chromatolytic changes in the central nervous system of the woodchuck during hibernation, reporting that they could not detect any modification in the Nissl granules characteristic of hibernation, when compared with the non-hibernating state. Lewis (*Anat. Rec.*, x) has investigated sea water as a medium for tissue culture. She finds that if the sea water is made isotonic with the plasma of the form from which cultures are to be made and ten parts of bouillon made from the muscle of the form in question is added, with 0.02 grams of $NaHCO_3$ and 0.25 grams of dextrose added to 100 cc. of the sea-water-bouillon mixture, a favorable culture medium is obtained. Stockard (*Am. Jour. Anat.*, xviii) reports on the development and wandering of mesenchymal cells in embryos of the teleost, *Fundulus heteroclitus*. The yolk sac is clear and is covered by only a single layer of ectoderm, enabling observation at different stages of development in living eggs. The wandering cells begin migration from the edge of the germ shield when the embryo is about 40 hours old. At 60 hours four distinct types of mesenchymal cells may be differentiated: black chromatophores, which ultimately form pigmented syncytia which surround the vitelline vessels; brown chromatophores, not so large, remain separate, are branched and also attached to vessel walls; elongated spindle-shaped cells, which at 48 hours aggregate in definite groups, later arrange in linear cords and become tubular vessels; small globular cells, which develop into colored blood cells. E. R. Clark (*Anat. Rec.*, xi) presents the results of a study of the reactions of mesenchymal cells in the tadpole tail toward injected oil droplets, injected to test the hypothesis that the differentiation of blood and lymph endothelium may be stimulated by the mechanical pressure exerted on the mesenchymal cells by the accumulation of fluid. The behavior of individual cells toward droplets of sterile paraffin oil was observed for days in the living tadpoles. No special reaction was noted. W. G. Clark (*ibid.*, x) has shown by experimental methods that living connective tissue reacts to the presence of a smooth non-irritating foreign body in such a way that there results a distinct pavement layer of flattened cells. These results

are said to argue against a specificity of endothelium and mesothelium. Shipley (*ibid.*) reports finding hæmoglobin-bearing cells in tissue cultures of the primitive area vasculosa, for the most part abnormal in form and size (see also XXV, *Zoölogy*). The observations show that the life of cells in cultures is not merely a series of survival phenomena. Spaeth (*Jour. Exp. Zoöl.*, xx) presents morphological, embryological and physiological evidence that the melanophores of fishes, amphibia and reptiles are functionally modified smooth-muscle cells, and that the color changes in these forms are brought about by the physiological response of special smooth-muscle cells. Laurens (*ibid.*), in an experimental study on the melanophores of *Amblystoma* larvae, finds that they are adaptive in that they respond either to relative intensity of light or to the color and intensity of the background. The eyes possess an important control over the melanophores, the epiphysis not. Allen (*Anat. Rec.*, x) presents results of an extended series of experiments on methods of fixation, dehydration and embedding. A modified Bouin's fluid to which urea is added is recommended for fixation and an apparatus for gradual alcohol concentration during dehydration is suggested. Cell mitoses in brain and testis tissue were specially investigated. (See also XXV, *Zoölogy.*)

Development and Growth.—Hartman (*Jour. Morph.*, xxvii) has contributed an excellent account of the cleavage and early blastocyst stages of the opossum; the blastocyst is complete with about the 40-cell stage (see also XXV, *Zoölogy*). Spurgeon and Brooke (*Anat. Rec.*, x) report on implantation and early segmentation stages of the opossum (see also XXV, *Zoölogy*). The first cleavage plane is meridional, resulting in two equal blastomeres. The second cleavage is in the equatorial plane resulting in smaller cells at the animal pole. Kirkham (*ibid.*) has endeavored to ascertain the cause of the prolongation of the gestation period in suckling mice. From a study of a long series of embryonic stages obtained from both suckling and non-suckling mice, it was found that ovulation, fertilization and early cleavage stages bear the same time relation to parturition in both suckling and non-suckling mice. Implantation in the uterus in non-suckling mice takes place on the fifth day following parturition; in suckling mice with three or more young, on the 14th day following parturition, the blastulas lying free in the lumen of the uterus from the sixth to the 14th day. Swift (*Am. Jour. Anat.*, xviii) has considered the origin of the definitive sex cells in the chick and their relation to the primordial germ cells and reports on observations on the histogenesis of the gonads in the female chick. He finds that during the two days subsequent to the development of the germinal epithelium (about 3½ days) the majority of the germ cells are found in this tissue. During the sixth and seventh day of development the germinal epithelium by proliferation forms medullary cords, including a few primordial sex cells. In the male these cords form the seminiferous tubules and contain the majority of the primordial sex cells. In the female, beginning with the eighth day and extending to the 11th day, active proliferation of the primordial sex cells of the germinal epithelium occurs, giving rise to lobulations which appear on the under surface of the germinal epithelium, forming cortical cords which contain the oögonia which develop into the definitive ova.

E. L. Clark (*ibid.*) reports on a study of the lymph flow in the early superficial lymphatics in living chick embryos varying in age from 5½ days to nine days. In the primitive superficial plexus as found in the fifth day there is no lymphatic circulation, the lymphatics containing blood cells, the pressure in the veins with which the lymphatics of certain regions are connected, being higher than in the lymphatics. As the pressure in the lymphatics is established a feeble lymph flow is observed. The formation of definite lymph channels is due to lymph flow and mechanical factors. Squier (*Anat. Rec.*, x) finds that the pulmonary blood circuit is established in the 72-hour chick, though not necessarily in its definite form. Definite conclusions as to the

ultimate origin of the pulmonary veins were not reached. Watt (Carnegie Inst., Wash., Contrib. to Embryol., Pub. No. 222) presents a very careful description of twin human embryos with 17 to 19 paired somites. The detailed account is based on total and partial reconstruction of one of these embryos, with a study of the serial sections of both of them. The external form of the embryos and the state of development of the notochord and somites, of the alimentary, vascular, urogenital and nervous systems are in turn considered. Pronephric tubules with Wolffian duct are present in the ninth to tenth segments. No mesonephric tubules are as yet developed. The two embryos are almost exact duplicates although they are not identical or real twins. Bremer (*Am. Jour. Anat.*, xix) in an investigation of the interrelation of the mesonephros, kidney and the placenta in different classes of mammalian embryos notes that mammalian embryos may be divided in two classes: those which retain a functional mesonephros until the kidney is capable of excretion, and those in which the mesonephros degenerates before the kidney is capable of excretion. In animals with early degeneration of the mesonephros the placenta is provided with an apparatus similar to the glomeruli of the mesonephros, appearing in the placenta at about the time when the mesonephros degenerates. In the placenta of mammals with a continuous embryonic urinary secretion no such placental structure differentiates (see also XXV, *Zoölogy*). Bremer (*Anat. Rec.*, x) describes mesonephric tubules in the anterior region of the mesonephros of ruminants which present fused corpuscles and no glomeruli but with capillaries in relation with all sides of the glomerular cavity; these differ from the usually observed mesonephric corpuscles. Kingsbury (*Amer. Jour. Anat.*, xviii) presents observations on the development of the human pharynx, based on wax reconstructions of the pharyngeal region of human embryos of varying ages. The branchial pouch derivatives are serially considered as to their morphogenesis and arguments presented for denying their distinctive branchiomeric organ character. This is especially emphasized with reference to the thymus, the development of which is regarded as a reaction degeneration, presenting a typical epithelial growth with altered relation to the mesenchyme. Locy and Larsell (*ibid.*, xix and xx) present an excellent account of the development of the avian lung, tracing the formation of the bronchi, air sacs and recurrent bronchi from anlage to the adult stage. The development of the recurrent bronchi and of the air sacs and the establishment of intercommunications between all parts of the bronchial passages give the bird's lung a unique structure differing from that of other vertebrates. Kernan (*Jour. Morph.*, xxvii) gives a detailed description of the chondrocranium of a 22-mm. human embryo reproduced at a magnification of 75 diameters by means of the Born wax-plate method, comparing his findings with observations of Van Noorden, Jacobi, Levi and Macklin, who have studied and modeled the chondrocrania of younger and older human embryos. Shipley and Macklin (*Anat. Rec.*, x) report that regions of new bone formation, before the deposition of lime salts is evident, can be vitally stained by the introduction into the peritoneal cavity of a sterile one per cent. solution of trypan blue. Preparations may be fixed in neutral formalin and cleared or decalcified and studied in sections. Donaldson (*The Rat*, Mem. No. 6, Wistar Inst.) gives a comprehensive review of the literature dealing with the structure and physiology of the albino and Norway rat. A summary of the excellent observations on growth phenomena of the albino rat conducted by Donaldson and his coworkers is presented with numerous growth curves and tables. King (*Anat. Rec.*, x) has studied growth of body and of the nervous system in albino rats undersized at birth. It was found that undersized individuals are not necessarily runts, but may attain normal adult size. All of the rats are not born with equal capacity for growth even under most favorable conditions. Body weight at birth indicates the prob-

able capacity of the individual for subsequent growth. Hatai (*Jour. Comp. Neur.*, xxv) has studied the brain weights resulting from crosses between wild Norway and domesticated albino rats, finding that the brain weights of the offspring are between the brain weights of the Norway and albino rats respectively. (See also XXV, *Zoölogy.*)

Internal Organs, Development and Structure.—Myers (*Am. Jour. Anat.*, xix) has reported on the growth and distribution of the milk ducts in the white rat from birth to the tenth week. Reconstructions and cleared toto preparations of successive stages were made and figured. One primary duct is present in each gland; secondary, tertiary and terminal ducts with numerous end buds on a large number of terminal ducts were observed, but no true alveoli. Considerable individual variation was noted. A period of active growth was observed at the end of the fourth or fifth week and again at the ninth week, the latter period corresponding to puberty. Baumgartner (*ibid.*) gives a detailed account of the development of the liver and pancreas in *Amblystoma punctata*, based on sections and numerous reconstructions of successive stages. The anlage of the liver from a medial, ventral projection of the gut, the shifting of the liver anlage, of the gall bladder and ducts is noted for successive stages. The development of the two main lobes of the pancreas is traced. Scammon (*Anat. Rec.*, x) reports on observations on the development of the biliary system in animals lacking a gall bladder in post-fœtal life. Lamprey, pigeon and rat were more especially studied, and it was found that the history of the gall bladder was quite different in each and that the occasional absence of the gall bladder in man is not explained by observations made. Sundwall (*ibid.*, xx) reports on an extended study of the minute anatomy of the lachrymal gland of the ox. The gland consists of six to eight compound tubular glands, each with main duct, primary, interlobular, intralobular, intercalated ducts and tubules. Under certain conditions of fixation the secretory granules were found to react toward well known serous and mucous stains. The gland is not, however, one that secretes mucus. Mitochondria are present in the cells of the tubules, especially the cells of the inter- and intralobular ducts. Intercellular secretory capillaries were observed and an intracellular canalicular system. Bensley (Harvey Lectures, Series X) presents a critical review of the literature dealing with the islands of Langerhans and reports on investigations as to their structure and function. It was discovered that the islets could be stained differentially by injection of janus green and neutral red and the duct system by injection of pyronin and methylen blue. About 50,000 islets are found in the pancreas of the guinea pig. Their number is not decreased nor increased by physiologic activity or starvation. Ligation of the pancreatic duct leads to degeneration of the alveoli, with preservation of the islets. Schochet (*Anat. Rec.*, x) presents evidence going to show that the rupture of the Graafian follicles is in part due to a digestive action of the theca folliculi by a proteolytic ferment. The work was based on the principle of Abderhalden's dialyzation reactions as modified by Grützner. Liquor folliculi gave positive reactions with fibrin. Goetsch (*Johns Hopkins Bull.*, xxvi) reports on a study of the influence of pituitary gland and ovarian extract feeding or growth and sexual development. The growth and weight observations were controlled by a study of microscopic sections of the sex glands and the genital tract. Anterior-lobe pituitary extract fed to young animals had a stimulating effect on growth of the animals and upon sexual development and activity. Posterior-lobe extract had a retarding influence. Ovarian extract had a stimulating influence upon the sexual development of the female and a retarding influence on the male, though weight of the male may be increased, due to a general adiposity. Schaeffer (*Am. Jour. Anat.*, xx) has considered the genesis, development and adult anatomy of the naso-frontal region in man, finding that the sinus frontalis in the vast majority of cases is a derivative of the recessus

frontalis or the anterior ethmoidal cells. The naso-frontal duct and the ethmoidal infundibulum are in the majority of cases discontinuous channels, but may be in direct continuation. Kush and Boas (*Anat. Rec.*, x) have investigated the carrying angle in the forearm, finding that in the female it is about three degrees smaller than in the male and that the right carrying angle is about three degrees smaller than the left. In left-handed individuals the right and left carrying angle is about equal. Jordan (*ibid.*) reports on a study of the myofibrils in the leg muscle of the sea spider. The banding in uncontracted myofibrils is described and figured. Contraction appears to be due to a shortening and thickening of the myofibrils with streaming of the stainable substance from the M to the Z membranes. (See also XXV, *Zoölogy*.)

Blood and Lymph-Vascular Systems.—Danchakoff (*Anat. Rec.*, x) presents an investigation on the wandering cells in the loose connective tissue in birds, considering their histogenesis. In the connective tissue of birds a certain number of wandering cells are normally found. These are developed from mesenchymal cells by withdrawal of processes, the cell becoming mobile. Environmental conditions determine further development. The mesenchyme is polyvalent in its potencies of development. The experimental results in tissue grafting give strong support to the monophyletic view of the origin of the different blood cells. This observer (*ibid.*) has further presented a summary of observations on the origin of red blood cells from the viewpoint of the monophyletic school. It is the contention that in early embryonic stages there is present a common mother cell, of mesenchymal origin, for the several types of blood cells. This mother cell is present in the adult organism and becomes a source of differentiation and regeneration of blood cells, and probably also of their pathological proliferation. Emmel (*Am. Jour. Anat.*, xix) contributes a study of certain cell clusters found in the ventral part of the dorsal aorta of mammalian embryos (see also XXV, *Zoölogy*). The cells of these clusters present cytological characteristics comparable to the basophilic mesameboid cells of the embryonic circulation. They are derived from endothelium, become detached and contribute to the cellular elements of the circulation. They are found to be intimately associated with developmental processes involving atrophy of certain aortic branches and in pig embryos are present in embryos having a length from five to 15 mm. respectively. This observer (*ibid.*, xx) has also investigated certain cellular elements found in the celomic cavity and mesenchyme of mammalian embryos. In pig embryos, five to 12 mm., a basophilic macrophage type is found. The macrophages present structural variations correlated with functional activity. The evidence seems clear that these cells are derived from the celomic mesothelium. The eosinophilic nonphagocytic cells of the celomic cavity very probably represent degenerating erythrocytes. Jordan (*Am. Jour. Anat.*, xix) has investigated the microscopic structure of the yolk sac of pig embryos with special reference to the origin of the erythrocytes, finding pig embryos of 10 mm. the most suitable, for in this stage the yolk sac attains its highest degree of differentiation (see also XXV, *Zoölogy*). The entoderm cells are thought to contain presecretion filaments. The mesenchyme of the yolk sac was found to differentiate directly into endothelium or into hematoblasts. Hematoblasts were also found to differentiate from the endothelium. This author (*Anat. Rec.*, x) presents evidence to show that the yolk sac of pig embryos is an active source of hematoblast origin from the endothelium, since transition stages from primitive endothelium to erythrocytes are observed in suitable stages. Reagan and Thorington (*ibid.*) have studied the vascularization of the embryonic body of hybrid teleosts without circulation. The observations give evidence of a local origin of endothelium from the mesenchyme, also that vessels or vessel anlagen are hemophoric, blood cells having been found in vessel anlagen disconnected from the circulation and blood islands. Reagan (*ibid.*) has also studied the vascular tissue in chemically treated fish em-

bryos. He concludes that red blood cells can develop in the anterior mesenchyme or in the anterior vessels under conditions in which the heart pulsations could not have accounted for their position, and not only in the stem veins and in blood islands found in the caudal end of the embryo. Arey (*Science*, xxxxiv) contributes a study of the form of the mammalian red blood cell. The evidence gained from an examination of drawn blood diluted in human serum, and of circulating blood in non-anæsthetized living mammals justifies the conclusion that the biconcave disc represents the normal shape, concave-convex cups an occasional modification. Schulte (*Am. Jour. Anat.*, xx) reports on a study of the fusion of the cardiac anlagen and the formation of the cardiac loop in the domestic cat, giving a detailed account based on wax-plate reconstructions of successive stages of development of the myocardial mantle and the endothelial tube. The fusion of the former is accomplished with the aid of the middle cardiac plate, which is reduced to a ridge and makes the interventricular septum. The endocardium originates as does endothelium in other parts of the body, developing from the mesenchyme formed *in loco*. The early mesenchyme consists of separate cells or groups of cells, vacuoles appear, enlarging the containing cells to endothelium, the resulting vesicles uniting to form endothelial tubes, which fuse to form the endothelial heart tube. Bullard (*Am. Jour. Anat.*, xix) has shown that the cardiac muscle of mammals contains a nutritive reserve of neutral fat in the form of droplets arranged longitudinally in the sarcoplasm. This is decreased in inanition. Phospholipin found in the interstitial granules-mitochondria is not appreciably decreased by inanition. Visible neutral fat is of normal occurrence in the atrioventricular bundle. King (*ibid.*) gives a detailed description of observations made after injecting with Prussian blue or India ink the sheaths of the sinoventricular system, mainly in the bovine heart. On successful injection of the sheath of the sinoventricular system, the course and the distribution of the trabeculae of this system can be readily followed. This system is thought to consist of separate cells and not to present syncytial character. McCotter (*Anat. Rec.*, x) has described and figured three human hearts with persistent left superior vena cavae, each presenting a rare condition. He traces their embryonic origin and development. Wahl (*Am. Jour. Anat.*, xviii) has shown that the blood supply of the mammary gland during development and rest is in the main secondary to the blood supply of the skin and subcutaneous muscles, while during functional activity it is dependent on an extension of the vessels of the ducts and is thus more independent.

Nervous System and Organs of Special Senses.—Weed (*Anat. Rec.*, x) presents an investigation on the formation of the subarachnoid spaces. The fluid in these spaces was replaced in living pig embryos with isotonic solutions of potassium ferrocyanide and iron-ammonium citrate, later precipitated. Evidence is presented showing that the first extraventricular spread of the fluid, in pig embryos, occurs at the 14 mm. stage; a total filling of the perimedullary spaces is attained at the 26 mm. stage. The formation of these spaces is connected with a dilation of the mesenchymal spaces. Allen (*Jour. Comp. Neur.*, xxvi) presents observations on the development of the spinal cord and medulla of cyclostomes with special reference to the formation and expansion of the roof plate, showing that in most vertebrates three stages of expansion should be recognized: (1) enlargement of the dorsal portion of the embryonic central canal owing to migration upwards and outwards of certain of the roof-plate cells; (2) enlargement of the canal owing to increased pressure of the cerebrospinal fluid; (3) a final stage of expansion due to the appearance of the pontine flexure. Bailey (*ibid.*) contributes on the morphology of the roof plate of the forebrain and the lateral choroid plexuses in the human embryo. The regions involved were reconstructed in embryos of 19, 27.8 and 32.1 mm. crown-rump length. The choroid plexuses of the lateral ventricles were found to be composed of

two distinct portions. The neuroporic recess could not be determined with certainty; the paraphysal arch and velum transversum could be traced in embryos of 32 mm. length. The epiphysis shows indication of the presence of the homologue of the pineal vesicle of lower vertebrates. In a further contribution on the morphogenesis of the choroid plexus (*ibid.*), this author considers its formation in the turtle and reviews critically the literature. The observations support the conclusion that the lateral telencephalic plexus arises from the roof plate of the telencephalon to the tænia fornicis and in higher forms it oversteps the tænia fornicis and the medial hemisphere wall is invaginated; this latter portion dominates in development as the vertebrate scale is ascended. Burr (*ibid.*) notes that the forebrain of *Amblystoma* will not regenerate when its functional endorgan is completely extirpated, but will regenerate if the nasal placode is not extirpated, this acting as a stimulus to the regenerating telencephalon through the ingrowth of the olfactory nerves. He has also studied (*Jour. Exp. Zoöl.*, xx) the effect of removal of the nasal pits in *Amblystoma* and finds that the absence of the nasal pits results in a collapse of the cartilage surrounding the nasal sac and a reduction of the size of the telencephalon on the affected side, the removal of the pit depriving the developing brain of a stimulus necessary for its complete development, evident particularly after the olfactory organ on the unoperated side becomes functional. Coghill (*Jour. Comp. Neur.*, xxvi) reports on a study of the afferent nervous system of the head of *Amblystoma* embryos with a view of correlating anatomic structure and physiologic activity. He presents a detailed study of the development of the afferent head nerves and organs of special sense in a non-motile stage, early flexure stage, coil-reaction stage and early swimming stage. The entrance of the receptor field of the trigeminal nerve into function is closely correlated with the extension of its root fibers into the motor centers in the lower part of the medulla. Donaldson (*ibid.*) reports on a determination of the part played by the myelin in reducing the water content of the mammalian nervous system and states that the progressive diminution in the water content of the entire brain and spinal cord is mainly due to an accumulation of myelin, both diminution of the percentage of the water and myelin formation being a function of age. Keegan (*ibid.*) reports on a study on the fissuration and cerebral cortex areas of the Plains Indian brain, finding that the Indian brain presents in practically all features a high type of cerebrum; the great asymmetry of the two hemispheres in fissuration in the brain especially studied evidencing a highly specialized cerebrum. McCotter (*Anat. Rec.*, x) has investigated the length and extent of the human spinal cord, finding that its average length in the male is 44.79 cm. and in the female 41.8 cm. There is no definite relation between length of spinal cord and height of the subject and no definite ratio between length of vertebral axis and the spinal cord. The highest level at which the spinal cord was found to terminate was the level of the middle of the body of the 12th dorsal vertebra, and the lowest level, the inferior border of the second lumbar vertebra. Johnston (*Jour. Comp. Neur.*, xxvi) presents evidence showing that in reptilian brains there is located a comma-shaped area involving the rostral and lateral border of the pallium, which may be regarded as definite sensory and motor areas in the sense in which these are commonly used with reference to the mammalian pallium. Jenkins (*Anat. Rec.*, x) presents the results of an investigation on the form of the inferior olive. This mass of the gray matter of the medulla was reconstructed in human embryos of different ages. Figures of the models obtained are given with a description of the convolutions as presented in the models. Atwell (*ibid.*) reports on the relations of the chorda dorsalis to the hypophysis. In rabbit embryos the entoderm can not be said to contribute to the formation of the hypophysis. In the bird there is observed a small entodermal increment to the hypophysis, derived from the

notochord, but this is an accidental union of parts and not to be regarded as an entodermal contribution to the hypophysis. Koch (*Jour. Comp. Neur.*, xxvi) reports on a study of the III, IV, V, VI, IX, XI and XIIth cranial nerves, mainly as observed in pyridin-silver preparations. He finds unmyelinated fibers in the V, VI, IX and XIIth cranial nerves, probably derived from the sympathetic in the VI, IX and XIIth. Kocher (*ibid.*) has investigated the effect of activity on the structure of nerve cells. There was found to be no difference in size of cells or nuclei resulting from activity and no qualitative differences in histological character between fatigued and resting nerve cells. Ranson and Billingsley (*Am. Jour. Phys.*, xxxxi) have by electrical stimulation of the floor of the fourth ventricle in cats determined a region in the fovea inferior producing rise in blood pressure, and a depressor point causing a fall in blood pressure in the area postrema just lateral to the obex. These observers (*ibid.*) present experimental and anatomic evidence which warrants the conclusion that pain and temperature sensations aroused by objects under 22° or over 40° C are mediated by afferent non-myelinated fibers entering Lissauer's tract and ending in the substantia gelatinosa. Streeter (*Am. Jour. Anat.*, xix) presents observations bearing on the development and vascular drainage of the endolymphatic sac and its topographic relation to the transverse sinus. In 30 mm. human embryos the main features in the differentiation of the saccus endolymphaticus are obtained and its topographic relations are practically as in the adult; lying against the median or dorso-median wall of the transverse sinus, covered by the dura mater. Throughout the greater part of fetal life the sac is surrounded by a vascular plexus, well developed in embryos of 50 mm. length. In embryos of 100 mm. length and over, a few principal channels connect this vascular plexus with the transverse sinus. Hardesty (*ibid.*, xviii) has in a number of publications endeavored to show that the tectorial membrane of the cochlea is the chief vibratory structure. In this contribution he describes in detail a model so constructed as to simulate the chief receptive and vibratory structures of the cochlea, and was able to obtain corroborative evidence of selective tectorial membrane vibration. Arey (*Jour. Comp. Neur.*, xxv) presents a very useful review of the important literature dealing with the effect of light on the retinal elements, deducing from the present status of our information concerning movements of the visual cells and retinal pigments the general conclusion that these movements have a certain significance in connection with light perception, but they are to be interpreted only in terms of protoplasmic responses to definite stimulating agents. He has sought also (*ibid.*, xxvi) to determine experimentally the presence of efferent nerves to the eye controlling the movements of visual cells and retinal pigments. Evidence is presented showing the existence of efferent nerve fibers in the optic nerve and probably in the ciliary autonomic nerves, through the balanced action of which movement in the retinal pigment and visual cells is alone possible. Also (*ibid.*) in studying the changes in the rod visual cells of the frog due to action of light it was observed that no movement of the nuclei of the rod visual cells, due to action of light, is demonstrable and that the myoid of these cells elongates and becomes tenuous in light and shortens in the dark. In a further study (*ibid.*) it is shown that both in light and in darkness the retinal pigment of fishes shows greater expansion at low than at high temperatures. Cone myoids of fishes shorten at low temperature in the dark and lengthen at high temperature, as also the myoids of rods. Correlation between length of rod myoid and temperature was not detected in the frog, neither in darkness nor in the light. Detweiler (*Jour. Exp. Zoöl.*, xx) reports on the effect of light on the retina of lizards and tortoises. The retinae of the former possess only cone visual cells. Light causes a migration of the pigment and a contraction of the cones, even after the optic nerve is cut. Electrical stimulation of enucleated eyes causes a movement of the pigment.

PHYSIOLOGY AND PHARMACOLOGY

S. J. Meltzer

Blood and Circulation.—The phenomena of hibernation has been ascribed to the accumulation of CO_2 in the blood. Rasmussen (*J. P.*,[1] xxxix, 20) investigated the blood gases of the woodchuck during activity as well as during hibernation and found that the amount of CO_2 in the blood of this animal is at all times greater than that of other mammals, but it increases progressively during hibernation and decreases when the animal wakes up. The difference between the amount of CO_2 in the arterial and that of the venous blood is much greater during hibernation. The same author (*ibid.*, xli, 162) established in a later study that the anæsthesia which has to be used during the activity of the animal does not influence the above stated relations.—It was found by Bert and others that in animals living at high altitudes the oxygen-carrying power of the blood is increased. This fact was explained by Bert and others by the assumption that this greater oxygen capacity at great altitudes is due to the decrease in the partial pressure of oxygen in the atmosphere respired, which decrease causes an increase in the erythrocytes and hemoglobin. Dallwig, Kolls and Loevenhart (*J. P.*, xxxix, 77) established experimentally that indeed a decrease in the oxygen tension of the respired air, obtained by decreasing the oxygen concentration at atmospheric pressure, stimulates the bone marrow and increases the erythrocytes and hemoglobin in the circulating blood of rabbits, white rats and dogs. The optimum oxygen pressure for increasing the oxygen capacity of the blood is apparently not far from 10 per cent. of an atmosphere. But stimulation results even when the oxygen pressure falls to six per cent. of an atmosphere.—The morphological changes in the tissues of the rabbit as a result of reduced oxidations have been studied by Martin, Bunting and Loevenhart (*J. Phar.*, viii, 112). The tissues of the heart, liver and the kidneys show considerable and serious changes. The general impression obtained is that the cells farthest removed from the blood supply show the most pronounced lesions.—In a previous communication by Lamson it was shown that an intravenous injection of epinephrin in dogs and cats causes an increase in the number of erythrocytes per unit volume of blood which does not occur if the hepatic artery was previously ligated. In an investigation by Lamson and Keath (*J. Phar.*, viii, 247) it was established that when the hepatic artery is ligated, intravenous injection of epinephrin causes a decrease in plasma volume without causing an increase in the number of erythrocytes. It has been shown further that plasma volume and the number of erythrocytes per unit volume of blood may vary independently of one another.—Lamson (*ibid.*, viii, 167) found that in rabbits neither the intravenous injection of epinephrin nor emotional stimuli cause an increase in the red cell of the blood. This indicates that there is a difference between carnivora and herbivora with regard to the regulation of the number of red cells in the blood by the liver.—Anderson and Neill (*M. R.*, xxxiii, 141) studied the blood picture of healthy rhesus monkeys, comparing it with the blood picture of man, and found that the red blood cells are slightly lower. Hemoglobin does more nearly approximate the normal values; white blood cells are also within normal limits, and basosphiles show relative preponderance over the polymorphonuclear leucocytes in monkey blood, contrary to the opposite ratio in adult human beings.

Howell (*J. P.*, xl, 526) studied the structure of fibrin-gel. In blood of vertebrates the fibrin is deposited in

[1] References to periodicals are given under the following abbreviations: *J. P., American Journal of Physiology; J. Phar., Journal of Pharmacology; M. R., Journal of Medical Research; E. M., Journal of Experimental Medicine; B. Ch., Journal of Biological Chemistry; I. M., Archives for Internal Medicine; J. A. M. A., Journal of the American Medical Association; N. A. S., Proceedings of the National Academy of Sciences; E. B. M., Proceedings of the Society for Experimental Biology and Medicine.*

needles which form a close mesh work. They are formed separately by an aggregation of fibrinogen particles. The normal clot may be described as a crystalline gel. The blood of invertebrates (crab) gives a structureless gel. By increasing the alkalinity, mammalian blood may be modified so that it also gives a structureless gel with thrombin.

The Drinkers (*ibid.*, xli, 5) present experimental evidence that in the bone marrow prothrombin is formed in large amounts, but not fibrinogen. The megacaryocytes are the probable source of the marrow prothrombin.—When a small amount of blood is introduced slowly into the pleural cavity, it remains in large part fluid; small clots are always present. Denney and Minot (*ibid.*, xl, 454) found that the fluidity of the blood is due to the absence of fibrinogen, which has been used up in the formation of small coagula.—It was found that oxalated plasma when shaken with chloroform clots without the neutralization by calcium. Minot (*ibid.*, p. 131) studied the effect of chloroform on the factors of coagulation and found that chloroform does not convert prothrombin into thrombin, does not weaken the action of a solution of thrombin, but it renders antithrombin inactive.

Gesell (*J. P.*, xxxix, 237) studied initial length, initial tension and tone of auricular muscle in relation to myo- and cardiodynamics, in support and explanation of his previous assertion that the auricular systole exerts a beneficial effect on the ventricular output.—The same author (*ibid.*, xl, 267) studied further the cardiodynamics in heart block, as affected by auricular systole, auricular fibrillation and stimulation of the vagus nerve, for the purpose of elucidating the relation of ventricular efficiency to ventricular filling and for analyzing and correlating the various effects of auricular contraction on cardiodynamics.—Wiggers (*ibid.*, p. 213) studied the auricular myogram and auricular systole by a new method and a novel apparatus.—Meek and Eyster (*ibid.*, xxxix, 291) made experiments by means of the cardioelectrograph to establish the exact origin of the cardiac impulse in the turtle's heart.—Schlomovitz and Chase (*ibid.*, xli, 112) tried to attain a similar result as the last named authors by means of cooling and heating.

According to Porter and Turner (*J. P.*, xxxix, 236) the general arterial tonus and the vasomotor reflex are not controlled by the same nerve center. Curare leaves the tonus unchanged and increases the vasomotor reflexes. Alcohol also does not affect the tonus but abolishes the vasoreflexes.—In experiments on cats in which the floor of the fourth ventricle was freely exposed, Ransom and Billingsley (*ibid.*, xli, 85) established by means of electrical stimulation the presence of sharply localized pressor and depressor points in the proximity of Ditmar's vasoconstrictor center. The authors leave it undecided whether these points are true centers or if they merely represent the central connections of afferent vasomotor fibres.—Hooker (*ibid.*, xl, 43) studied the venous blood pressure in men of different ages and found that a progressive rise takes place practically throughout life.—The Drinkers (*J. P.*, xl, 515) developed a method of prefusing the tibia and demonstrated the existence of vasomotor nerves to the bone marrow which responds to electrical stimulation and injection of epinephrin.—Gunning (*ibid.*, xli, 1) found that in the branches of the arterial tree which may be of great variations in diameter and of varying initial systole and mean pressure, the vasomotor reactions, pressor and depressor, remain equal.—In studying the effect of stimulation of one splanchnic nerve upon the kidneys by the oncometric method Burton-Opitz (*ibid.*, xl, 437) was able to support his former view that innervation of the kidneys is unilateral. The decrease in the blood supply of the kidney, subsequent to the stimulation, the author explains now by the action upon the blood vessels of the kidney of the increased adrenin, brought about by the effect of stimulation of the splanchnic nerve upon the adrenal gland.

Bogert, Underhill and Mendel (*J. P.*, xli, 189, 219, 229) found that after intravenous injection of even very large quantities of saline solu-

tions the blood volume is restored to normal within 30 minutes. The activity of the kidneys is not essential to this regulation of the blood volume, although in nephritis this regulation is manifestly disturbed. The regulation of the blood volume is usually less efficient when colloidal solutions are injected. The addition of alkali (to saline solutions) has no apparent effect on the regulation of the blood volume either in normal or in nephritic animals.—Kleiner (*E. M.*, xxiii, 507) found that when a large amount of dextrose is injected intravenously into a normal dog it disappears from the circulating blood in about 90 minutes after the end of the injection; about 60 per cent. (average) is eliminated through the kidneys. But even in nephrectomized animals the same quantity will leave the circulation in the same length of time as in normal animals. Kleiner and Meltzer (*N. A. S.*, ii, 369) found that morphin increases considerably the elimination through the kidneys of intravenously injected dextrose; at the same time it retards the return of the sugar content of the blood to its previous level. They express their findings by the statement that morphin increases the *physiological permeability* of the kidney cells while it decreases this permeability of the endothelia of the capillaries of other body tissues.

Glands with Internal Secretion.—Richards and Wood (*J. P.*, xxxix, 54) find that stimulation of the depressor nerve lessens the intensity of the reaction for epinephrin in blood collected during stimulation from the suprarenal veins.—Fulk and Macleod (*J. P.*, xl, 21) found that acid extracts of the retroperitoneal chromaphil tissue of man, the dog, the cat, the rabbit, the guinea pig, the white rat, the calf, the sheep and the pig have the same physiological action on intestinal and uterine muscle as the active principle of the medulla of the suprarenal gland.—According to Marshall and Davis the adrenal gland exercises an influence upon the elimination through the kidneys. In adrenalectomized cats the kidney function showed a decrease as measured by the urea content of the blood and excretion of phenolsulphonephthalein; the nitrogen output in the urine was decreased and waste products accumulated in the blood.—Stewart, Rogoff and Gibson (*J. Phar.*, viii, 205) employed in dogs and cats the method first used by Joseph and Meltzer in rabbits, and established in careful experiments that stimulation of the peripheral end of a splanchnic nerve causes a dilatation of the pupil on the side in which the superior cervical ganglion was previously removed. This proves that the splanchnic nerve innervates the adrenals and that stimulation of that nerve causes an outpour of adrenin from the gland.—Lewis (*B. Ch.*, xxiv, 249) could not establish the presence of epinephrin in human fetal adrenals.—Auer and Gates (*E. M.*, xxiii, 757) found that adrenalin when injected intratracheally is absorbed very rapidly, more rapidly and effectively with smaller doses than from intramuscular injections, and absorption still takes place after the development of pulmonary edema.—According to Shamoff (*J. P.*, xxxix, 268) some substance exists in the posterior lobe of the pituitary body which exerts an effect upon the isolated intestinal loop resembling the action of adrenalin and which may be other than that which raises blood pressure and causes diuresis. The presence of this substance in an extract from this gland seems, however, to depend upon the mode of its preparation.—Wahanbe and Crawford (*J. Phar.*, viii, 75) come to the conclusion that pituitary extracts when prepared by certain methods yield color reactions and produce certain physiological actions which would suggest the presence of epinephrin or an epinephrin-like compound.—The experiments of Keeton and Becht (*J. P.*, xxxix, 109) led them to the conclusion that electrical stimulation of the hypophysis under insufflation anæsthesia causes hyperglycæmia which does not occur if the splanchnic nerves were previously sectioned.—Shamoff (*ibid.*, 279) states that stimulation of the superior cervical ganglion leads to a discharge of hypophysial secretion which produces diuresis as well as glycosuria.—In order to utilize the action current as an indicator of se-

cretion in ductless glands, Cannon and Cattell (*ibid.*, xli, 39) studied first the electromotive phenomena accompanying the salivary secretion after electrical stimulation of the chorda and the cervical sympathetic in cats under various conditions, for which purpose they developed a method for registering the excursions of a d'Arsonval galvanometer. From their experiments they draw the conclusion that the change in the action current is a manifestation solely of the secretory process. The action current brought about by stimulation of the sympathetic can be augmented by stimulation of the chorda and *vice versa*. The direction of the action current from the submaxillary gland may be reversed although the physiological response to stimulation remains as usual.—The same authors (*ibid.*, 58) studied the innervation of the thyroid glands by the above described method and came to the conclusion that the secretory nerves are the non-medullated fibres which are distributed to the thyroid cells and which are derived from the sympathetic. The impulses pass to the outlying neurones through cell bodies which are located close below the superior and in the inferior cervical ganglion. The vagus and its branches do not contain secretory nerve fibres for the thyroid gland.—The same authors report in another study (*ibid.*, 74) that injection of small doses of adrenalin or stimulation of the splanchnic nerves physiologically separated from the central nervous system evoke an action current of the thyroid gland.—Levy (*ibid.*, 492) found that after stimulation of the cervical sympathetic in the neck, or after injection of adrenin, even in minute amounts, an increase of the effectiveness of adrenin in raising blood pressure can be demonstrated. This effect is manifest only after a latent period which may vary from about 40 to 60 minutes. Stimulation of the thyroid gland through its secretory nerves (sympathetic) causes no change in blood pressure.—Cannon and Fitz (*J. P.*, xl, 126) found that in an animal with a rapid heart, falling hair, increasing excitability, and a steadily mounting metabolism, which had reached about 60 per cent. above the average (all these symptoms resulting from the union of the phrenic nerve to the cervical sympathetic trunk) removal of the thyroid gland on the operated side stopped the progress of the disease and the progress of the metabolism down within normal limits. While other animals with the disease had died within three months of the first appearance of symptoms, this animal lived normally for seven months after the operation, and was then purposely killed.

Nervous System and Muscles.—Forbes and Gregg (*J. P.*, xxxix, 172) made a further study of the correlation between strength of stimuli and the direct and reflex nerve response. They found that whereas when a mammalian nerve trunk, such as the sciatic or one of its nervous branches in the cat, is stimulated with single induction shocks of graded intensity, the magnitude of the electrical response normally reaches a maximum beyond which, with further increase in strength of stimulus no further increase in response occurs; such a maximum is not reached in reflex responses to graded single-shock stimuli. The first result seems to correspond to the "all-or-none" law. It seems to the authors that there is an incompatibility between this law and the doctrine of the "graded sympathetic resistance" which has been used to explain the familiar spread of reflex activity in response to stimuli of increasing strength.—In a study of the segmental action of strychnin, McGuigan, Keeton and Sloan (*J. Phar.*, viii, 143) came to the conclusion that the normal spread of motor impulses is caudalward, and therefore a stimulus which produces a general movement of the body when applied to the front leg, may cause only a local reflex when applied to the hind leg. This holds true also for anæsthetized animals but the rate of the spread is slower. Strychnin acts directly upon the motor neuron and spreads in the cord downward more quickly than upward.—Hammet (*J. Phar.*, viii, 175) comes to the conclusion that the peripheral action of strychnin has its site in the "receptive substance" of the neuromuscular junction. The action here is similar to its action in the cord leading to

a decrease in resistance to the passage of the nerve impulse.—Forbes, McIntosh and Sefton (*J. P.*, xii, 503) established that even when etherization in the cat is pushed to the point of abolishing respiration and causing death, the nerve trunk exhibits what appears to be essentially normal action currents. (See also XXIV, *Biological Chemistry.*)

Pike (*J. P.*, xl, 433) brings evidence for the explanation that the short contractions of the diaphragm occurring synchronously with the cardiac systoles is brought about by the action current of the heart, which is for some distance in contact with the phrenic nerves.—Ingebridgen (*E. M.*, xxiii, 262) found that the Wallerian degeneration occurring in peripheral nerves by incubation in Ringer solution and serum does not occur in plasma. No growth of peripheral nerves occurs in plasma; but after the fifth, the Wallerian degeneration gives rise to a growth of scycyntium of Schwan. In no case was growth of axis cylinder observed.—Quinby (*E. M.*, xxiii, 535) found that a single reimplanted kidney is able to maintain normal life, and comes to the conclusion that secretory nerves to the kidney do not exist.—Auer (*J. P.*, xl, 143) found that stimulation of the central depressor nerve in white rabbits narcotized by morphine usually causes a definite diminution in size of the pupil.—In fowls (chicken) the expiration is active. Meyer and Meltzer (*E. B. M.*, xiii, 123) found that the innermost of the abdominal muscles when carefully isolated contracts regularly with each expiration. Stimulation of the central end of the vagus *inhibits* these contractions, while the same stimulation causes a *tetanus* of the inspiratory muscles. It presents a classic instance of the "law of contrary innervation" (Meltzer) or "reciprocal innervation" (Sherrington).—Lee, Guenther and Meleny (*J. P.*, xl, 446) compared the diaphragmatic muscle with three other muscles (of the posterior extremity). They found that the excised diaphragm will work for a much longer period and accomplish far more than the other muscles before becoming exhausted; it is superior in absolute power and in tendency to summate stimuli; and it exhibits a greater tendency to respond to faradic and chemical stimuli by twitches, more or less rhythmical in character.—Meyer and Meltzer (*ibid.*, 126) found that by insufflating a fowl through the humerus at a pressure of about 10 mm. of mercury all respirations disappeared, the thorax stood still in a more or less exaggerated state of inspiration. On interruption of the prolonged insufflation, in most of the experiments the thorax immediately assumed an expiratory state in which it continued to stand still variously from a few seconds to half a minute and longer.

Digestive Canal.—Most of the experimental contributions to the knowledge of the physiology of the digestive canal which were carried on in this country during 1916 as well as in the last few years preceding were done in the physiological laboratory of the University of Chicago. A complete review of the work in this line will be found in a noteworthy book published recently by Professor Carlson, head of that laboratory (*The Control of Hunger in Health and Disease*, University of Chicago Press, Chicago).

Pharmacology.—According to McGuigan and Ross (*J. Phar.*, vii, 385), morphin when injected intraspinally into mammals in adequate doses will produce tetanus after a latent period, which will not be produced by codein. Morphin increases the tetanic effect of strychnin in frogs.—Macht, Herman and Levy (*ibid.*, viii, 1) have developed a convenient method for studying quantitively cutaneous pain sensation in man. According to their findings the principal opium alkaloids in respect to their analgesic power can be arranged in the following order: morphin, papaverin, codein, narcotin, narcëin, and thebain. A combination of the total opium alkaloids is much more effective than if the quantity of morphin they contain would be given alone. One case showed the idiosyncrasy that morphin produced rather a heightening of the threshold to pain than a lowering; this idiosyncrasy disappeared when morphin was given in conjunction with narcotin.—According to Smith (*ibid.*, vii, 407) there is a synergistic action between morphin and scopo-

lamin upon the frog's heart and upon the respiratory center of the mouse.—Barbour and Copenhaver (*ibid.*, 529) in studying the isolated surviving uterus of guinea pig and cat found that morphin as well as scopolamin in adequate doses increases the tone of that organ but could not demonstrate a synergism or antagonism between the direct actions of the two drugs upon the uterus.—Barbour (*ibid.*, 547) studied the actions of the two drugs upon the uterine activity in the normal animal and found that neither morphin nor scopolamin causes profound changes in the activity of the pregnant or nonpregnant uterus of decebrate cats. The delay in labor produced by either or both of these drugs is probably due to their cerebral action.—Barbour, Maurer and von Glahn (*ibid.*, viii, 124) found that tyramin (paraoxyphenylethylamin) is capable within certain limits of antagonising the respiratory depression produced by morphin in the rabbit and in man. Other morphin effects were definitely present after the two drugs had been given together, although the respiration was not diminished. The antagonism seems therefore due to the fact that tyramin is a powerful indirect stimulant of the respiration.—Myers (*ibid.*, 419) established that dogs habituated to morphin show a marked tolerance to codein and heroin in so far as effects upon the respiratory center are concerned; but there is no evidence of cross toleration to cannabis indica or to chloral hydrate.

The function of deglutition consists in a very complicated mechanism. For our purpose we have to distinguish three different acts: (1) the *initial* act, in which the muscles of the mouth, pharynx and larynx are concerned; (2) the *primary peristalsis*, in which the nervous impulse running through the center is the chief moving factor; (3) *secondary peristalsis* (Meltzer), which originates in local reflexes within the esophagus. In guarded and graded intravenous infusion of a solution of magnesium sulphate, Auer and Meltzer (*E. B. M.*, xiii, 106) succeeded in eliminating first the second act, that is, the transmission of the nervous impulse within the center, while the other two acts were still unaffected. Continuing the infusion the second act also became inhibited, that is, the local reflexes from the esophagus disappeared, while the first act was still intact. Finally, by further infusion, the first act also, the initial act of deglutition, became abolished. These experiments proved unmistakably that magnesium sulphate is capable of abolishing purely central effects and is accomplished by the smallest effective dose.—In a series of experiments on dogs, Auer and Meltzer (*E. M.*, xxiii, 641) established that by an intravenous injection of m/4 magnesium sulphate at a certain rate, very severe operations can be performed without any reaction from the animal, while the respiration remains entirely unaffected. The latter may become profoundly affected when the rate of infusion is too rapid or the injected quantity is too large. Under such conditions the respiration can be fairly rapidly restored by an intravenous injection of a calcium salt, or simply by discontinuing the infusion of the magnesium solution while the respiration is kept up for some time by pharyngeal insufflation (Meltzer).—The experiments on animals do not inform us definitely of the state of sensation and of consciousness of the operated individual. Peck and Meltzer (*J. A. M. A.*, lxvii, 1131) report three cases of human beings who were operated upon exclusively under the anæsthetic influence of intravenous injection of magnesium sulphate. One of the patients after being brought back to the ward had no idea that he was operated upon. Sensation and consciousness disappear before the reflexes.—Reviewing the experimental work and the clinical literature which was quite extensive in the first year of the war, Meltzer (*J. A. M. A.*, lxvi, 931) arrives at the conclusion that tetanus can be beneficially treated by solutions of magnesium sulphate and describes the method for its use. Robertson (*I. M.*, xvii, 677) in an excellent review of the same subject arrives at the same conclusion as Meltzer.—Gates and Meltzer (*E. M.*, xxiii, 655) found that subcutaneous or intramuscular injections of sodium oxalate in subtoxic

doses, when administered to an animal which received a subminimal dose of magnesium sulphate, produce profound anæsthesia and paralysis of long duration, although the usual effects of sodium oxalate alone are of a stimulating character. The effect in this case is probably due to the precipitation of the calcium salts within the body by the oxalate. An intravenous injection of a calcium salt in such a paralyzed animal restores it immediately.—Kleiner and Meltzer (*B. Ch.*, xxiv, 20) found that intravenous injection of magnesium salt in animals which receive artificial respiration throughout the experiment produces considerable hyperglycæmia with but little glycosuria. Since the animal had artificial respiration, the hyperglycæmia cannot be due to asphyxia.

PATHOLOGY AND BACTERIOLOGY

Martha Wollstein

Immunity.—Continuing his studies on immunological phenomena, Bull made exhaustive experiments to determine the fate of pneumococci when injected into the circulation of dogs (*Jour. Exp. Med.*, xxiv, 7). He found that the cocci disappear from the blood stream very rapidly but reappear in one or two days, reach their maximum multiplication between the fourth and fifth days and then decline in numbers, leaving the blood sterile in one, two, or three days more. The initial disappearance of the bacteria is due to the fact that they are agglutinated within the blood vessels, and the clumps are taken up by cells in the internal organs. In this process, however, the cocci are themselves modified, in that they become able to resist the antibodies present in the animal's body, or grow fast to them. It is these resistant, changed cocci which reënter the blood and multiply far more rapidly than the cocci originally injected were able to do. Then the animal forms new, strong antibodies, which overcome the cocci. During the final stage, when the infection is subsiding, the cocci have a greater susceptibility to the action of immune sera than do the organisms originally injected. That is, the immune bodies have become too strong for the bacteria to resist.

These facts may be applied to the explanation of the cause of any one of the infectious diseases. Thus the period during which the infecting agents are adapting themselves to the adverse conditions in the newly infected host forms the incubation stage, preliminary to the active stage of symptoms due to the rapid multiplication of the infecting agents. Epidemics arise because the infectious agent is passed from one person to another in the ascending stage of the disease, when the infecting agent is in a state of maximum resistance to the natural antibodies of such individuals. Finally, the subsidence of epidemics is brought about by the weakening of the infectious agent by acquired antibodies, provided that early contacts are avoided.

Kyes (*Jour. Inf. Dis.*, xviii, 277) studied the natural resistance of the pigeon to the pneumococcus. The normal temperature of the pigeon is 41° to 43° C., and this fact has been thought to explain the resistance of the bird to infection with the pneumococcus. Kyes has shown that while the high temperature may well be a contributory cause in that it inhibits the multiplication of the cocci, the special factor concerned in the resistance of the pigeon to pneumococcus infection is to be found in certain large cells in the liver and spleen. These fixed tissue cells (hemophages), whose normal function is the destruction of red blood cells, take up the pneumococci and destroy them. Kyes' work is important in showing the large *rôle* of fixed tissue cells in the removal of bacteria from the animal body.

Manwaring and Coe (*Jour. of Immunology*, i, 401) studied the principles concerned in the disappearance of virulent pneumococci from the circulation of immunized rabbits. By special methods they showed that the pneumococci leave the blood stream and are deposited in the liver because the immune serum contains an opsonin which causes the pneumococci to adhere to the cells forming the walls

of the capillaries within the liver. The capillaries outside of the liver are not affected. The authors believe that this special factor, in addition to the agglutinins of the serum emphasized by the work of Bull (*A. Y. B.*, 1915, 689) is needed in order that virulent cocci should be overcome by the animal.

Syphilis.—Since the spirochæte has been proved to be the etiological factor in syphilis and the absolute pathognostic sign of the disease, Warthin (*Am. Jour. Med. Sci.*, clii, 508) believes that our conception of both the pathological and the clinical sides of that disease must be reshaped. By the aid of Levaditi's method, which stains the spirochætes in tissues with silver, the organisms can be demonstrated and the nature of visceral lesions proved. From 1912 to 1914 Warthin found 41 autopsy cases (or one-third of all adult subjects) to be actively syphilitic on microscopical examination. He divides his cases into three groups: (1) known syphilitics, supposedly cured by treatment; (2) known syphilitics, still under treatment; (3) cases in which a history of syphilis could not be obtained or was denied by the patient, and no treatment was given. The combination of interstitial myocarditis, aortitis and orchitis fibrosa makes a pathological complex indicative of syphilitic infection in the male. In the female, the heart and aorta, pancreas and adrenals are most often affected. The number of spirochætes in the affected areas around small vessels is small, and the amount of inflammatory infiltration around them very slight; but the characteristic glandular lesion (pancreas, testis) is a fibroid one.

Warthin calls attention to the sociological importance of the fact that such a large proportion (one third) of adults coming to autopsy in the service of a general hospital should suffer from latent syphilis. That is, they are spirochæte carriers, and show active inflammatory areas as well as healed syphilitic lesions. The author believes that latent syphilis will be found to be the chief factor in causing myocarditis and the cardiovascular-renal complex. His experience is that the heart and aorta of every latent syphilitic are involved in the infection, consequently such a subject is a bad life-insurance risk and a possible source of danger to his intimates. Seminal transmission is probably the most dangerous possibility. Latent cases without history may be innocent congenital cases or victims of familial infection. Congenital syphilis in the third generation may not be recognizable during life; it runs a mild, latent course, sometimes without any clinical symptoms. The general hygiene of the spirochæte carrier is important, because we do not know the conditions in which spirochætes of low virulence become aggressive again. Therapeutically, promises of cure can never be safely made, for eugenically speaking neither absence of symptoms, of Wassermann reaction, nor of history can be taken as an absolute criterion of freedom from latent syphilis.

Zinsser, Hopkins and McBurney made extensive studies on *Treponema pallida* (*Jour. Exp. Med.*, xxiii, 323, 329, 341) in regard to its virulence and immunity reactions. They were unable to demonstrate any difference in pathogenicity between strains isolated from condylomata, chancres, a mucous patch or the nervous system; nor was the virulence of these strains changed during progressive rabbit passage. Agglutinative and treponemicidal antibodies were formed in rabbits and sheep immunized with cultures of *Treponema pallida*, but these antibodies could only be demonstrated for the culture organisms, never for virulent treponemata obtained directly from syphilitic lesions. The lack of serum antibodies in the infected body may be due to this inability to exert any serum action upon virulent treponemata and consequently to lack of antigen absorption.

In a further investigation (*Jour. Exp. Med.*, xxiv, 561), Zinsser, Hopkins and McBurney found that the agglutination of culture *pallidum* by the serum of syphilitic patients has no diagnostic value, since the serum of persons with diseases other than syphilis agglutinates *pallidum* almost as well, and normal individuals' serum but slightly less.

Kolmer, Broadwell and Matsunami (*ibid.*, xxiv, 333) were able to demonstrate specific agglutinins for *Treponema pallida* in the blood of patients affected with syphilis late in the primary stage. In the secondary stage 58 per cent. showed agglutinins in dilutions of one in five but never more than one in 20. In tertiary and latent syphilis 84 per cent. showed agglutinins in dilutions of one in five and higher. Agglutinins in the syphilitic sera do not run parallel with the Wassermann reaction.

Poliomyelitis.—The very severe epidemic of poliomyelitis (infantile paralysis) which occurred in the East during the summer and early fall of 1916 (see also *Medicine*, and *Public Health, infra*) has given a new impetus to investigation of that disease, for which no specific prophylactic or curative therapy is known. Rosenow, Towne and Wheeler (*Jour. Am. Med. Assoc.*, lxvii, 1202) undertook an etiological study, using Rosenow's special methods for the demonstration of the specific localizing power of bacteria, a power which he considers an important factor in the etiology of various diseases (*A. Y. B.*, 1914, p. 691). The authors report that they have isolated a peculiarly pleomorphic streptococcus from the throat, tonsils, and central nervous system in cases of infantile paralysis. With this coccus paralysis was experimentally produced in guinea-pigs, rabbits, cats, and dogs, all animals which have hitherto not responded to inoculation with the virus of poliomyelitis. Rosenow believes that the smallest form of this coccus may correspond to the filterable organism described and grown by Flexner and Noguchi (*A. Y. B.*, 1913, p. 716), and which is now generally accepted as the specific etiological factor in acute poliomyelitis. On the other hand, Rosenow thinks that the larger, more typically streptococcic forms which he and his coworkers describe may be forms of the same organism grown larger under suitable conditions. It must be said in justice to both the older and the newer work, that the clinical observations and the pathological lesions described by Rosenow, Towne and Wheeler in their experimental animals need further elaboration and detail before their conclusions can be accepted.

Scarlet Fever.—Mallory and Medlar (*Jour. of Med. Res.*, xxxv, 209) attacked the problem of the etiology of scarlet fever by studying the primary lesion, which starts, as a rule, in the tonsils and spreads to the faucial ring. In severe cases the nasopharynx, middle ears, epiglottis, larynx, trachea, or oesophagus may be involved. The lesions consist of necrosis of the superficial epithelium with acute inflammatory exudation, and may become either erosions or ulcerations more or less deep in extent. In the necrotic lesions of the tonsils, palate, faucial pillars, root of the tongue and trachea, the authors saw a Gram-positive bacillus in large numbers and practically pure culture. In a bronchopneumonic lesion the alveoli and the bronchioles contained masses of the same bacillus, which, apparently, forms little fibrine. It is more slender than the diphtheria bacillus, varies in length, and has a tendency to branch and form filaments. It grows rapidly under anaerobic conditions and more slowly aerobically. Gelatin is slightly liquefied; no sugars are fermented and no indol is produced. The bacillus was present at autopsy in five acute scarlet fever cases, one of which was fulminating in type. It was not found in over 500 cases dead of other contagious diseases. The organism was cultivated from five patients during life. In mild cases of scarlet fever the bacilli die out quickly and are not demonstrable two or three days after the eruption appears. On the other hand, they may persist in the throat or bronchi for weeks, and so make carriers. As a rule the *B. scarlatinae* (as Mallory and Medlar call this bacterium) disappears quickly from the lesions when streptococci appear secondarily. The organism is less virulent than the diphtheria bacillus, for which it has probably been mistaken in throat cultures. The authors were unable to demonstrate immune bodies to this Gram-positive bacillus in the serum of scarlet fever patients. Animal experiments gave only negative results.

Tuberculosis.—A valuable contribution to the diagnostic methods avail-

able in the study of tuberculosis has been made by Morton (*Jour. Exp. Med.*, xxiv, 419). He applied the fact, noted by Murphy and Ellis several years ago, that exposure to X-rays increases the susceptibility of white mice to tuberculosis by destroying their lymphoid tissue. Morton found that guinea pigs were tolerant of large amounts of X-rays, which reduced the number of their lymphocytes about one-half. Such treated pigs, when inoculated with a known tuberculous urine, developed tuberculous lesions in eight to 10 days, whereas the usual time required for the development of such lesions in normal guinea pigs is five to seven weeks. One massive dose of X-rays is sufficient to prepare the pig, and it may be given either shortly before or shortly after the inoculation of the material to be tested. The time saved is, obviously, a great help in many cases.

Krause has made a series of studies on immunity in tuberculosis (*Jour. Med. Research*, xxxv, 1, 25, 43), which suggest that tissue hypersensitiveness, as evidenced by the cutaneous tuberculin reaction, may be a function of immunity to reinfection. He has shown also that tubercle bacilli may remain viable and retain their virulence after being kept in a dried state for as long as 15 to 17 months. Naturally only a few of many dried bacilli stay alive.

Pneumonia.—Studying the types of pneumococci present in 50 cases of pneumonia in infants and young children, Wollstein and Benson (*Am. Jour. Dis. of Children*, xii, 154) found that the pneumococcus designated as Type IV by Dochez and Gillespie occurred in 60 per cent. of the cases. This type of pneumococcus is the one most frequently present in normal human mouths (*A. Y. B.*, 1915, 689). In adults scarcely 25 per cent. of pneumonias are due to this type of pneumococcus, and the mortality rate is very low. In infants, on the other hand, 40 per cent. of pneumonias caused by Type-IV coccus ended fatally. These facts are of interest in the epidemiology of pneumonia, and may explain how the virulence of Type-IV pneumococcus is maintained.

Weil's Disease.—Weil's disease is an infectious jaundice which occurs in epidemic form and has been seen in America, Europe, Asia, and Africa. It is endemic in Japan, where a detailed study by Inada, Ido, Hoki, Kaneko, and Ito (*Jour. Exp. Med.*, xxiii, 377) has resulted in the finding of a spirochæte in practically all the organs of the body, including the nervous system. The organism is excreted in the urine after as long a period as 40 days, and is also present in the sputum and feces, but not in the vomitus. Immunity to the disease is present after 14 to 15 days and may last for a period of years (5½).

Ito and Matsuzaki have grown the *Spirochæta icterohæmorrhagiae* or spirochæte which cause febrile jaundice in Japan in pure culture (*Jour. Exp. Med.*, xxiii, 557) and found that it retains its virulence for guinea pigs over many generations.

Ido, Hoki, Ito and Wani (*Jour. Exp. Med.*, xxiv, 471) found that the prophylaxis of Weil's disease must include the proper care of infected excreta (the source of the spirochætes), as well as the problem of active immunization. This latter method seems to offer the surest results, using a vaccine of dead spirochætes. The systemic effects of the inoculations are negligible; local swelling and redness often develop at the site of the injections, but disappear in 24 hours. Immune bodies appear in the blood and can be demonstrated by their protective action in infected guinea pigs. This partial immunity probably lasts six to 12 months. The authors were able to demonstrate the virulent spirochætes in the kidneys or urine of 30.5 per cent. of 86 rats examined, and call attention to the importance of this fact from the point of view of prophylaxis, since infected rats must be a source of danger to human beings who come in contact with such animals, as in the present case of the soldiers in the European trenches.

Inada, Ido, Hoki, Ito, and Wani (*ibid.*, 471) produced an immune serum from horses and studied the curative effect on patients with Weil's disease. They found that the serum has a spirochætocidal and a spirochæ-

tolytic action, in virtue of which it destroys the spirochætes in the circulating blood. It also promotes the formation of antibodies, and reduces the number of spirochætes in the organs. The ultimate effects of the serum on the mortality of patients have still to be determined.

Rocky Mountain Spotted Fever.—Rocky Mountain spotted fever is an acute infection which owes its name to the hemorrhagic rash which accompanies the disease. King and Ricketts proved that a tick transmits the infectious agent from cattle and horses to man. Ricketts described some bacillus-like bodies in the blood of human and experimental cases, but was unable to prove their exact nature. Wolbach (*Jour. Med. Res.*, xxxiv, 121; xxxv, 147) studied infected ticks and also guinea pigs and monkeys which had been infected experimentally by means of ticks. In the blood and tissues of these animals he found a parasite which occurs in two forms: a lanceolate-diplococcoid, and a smaller, rod-shaped form. The exact nature of this organism is still obscure, but Wolbach is inclined to classify it as a bacterium, and hopes to report more detailed results in a later publication. He believes that the rods described by Ricketts are the same as he has found. (See also *Public Health, infra.*)

Rat-Bite Fever.—Rat-bite fever is a definite febrile disease following the bite of a rat. It is common in Japan, much less so in continental Europe, but appears both in England and America. Blake studied a case in Boston and was able to cultivate a filamentous, branching organism from the blood both before and after death. He identified the growth as that of *Streptothrix muris ratti*, obtained by Schottmüller from a similar case in 1914. The organism produces inflammatory and degenerative lesions in the heart muscle, liver, kidneys, and adrenals; ulcerative endocarditis may also occur.

Some preliminary work reported by Futaki, Takaki, Taniguchi and Osumi (*Jour. Exp. Med.*, xxiii, 249) is of interest in this connection. They studied two patients suffering from rat-bite fever in Japan, and were able to demonstrate the presence of a spirochete in the skin of one patient and a similar organism in a lymph gland of the second case. Both patients recovered. The more detailed reports and cultural studies of this spirochete will be of interest, suggesting as it does that all cases of rat-bite fever may not be identical in etiology.

Amyloid Degeneration.—While attempting to produce chronic kidney lesions in rabbits by the repeated intravenous injection of living bacteria, Bailey (*Jour. Exp. Med.*, xxiii, 1916, 773) found that the animals treated with cultures of *Bacillus coli communior* developed amyloid deposits in the liver, spleen, and kidneys. Suppurative lesions were not present in most cases, and were therefore not a factor in causing the amyloid lesions. All the affected rabbits, however, showed kidney changes resembling the chronic parenchymatous nephritis often associated with amyloid disease in human beings.

Tissue Growth.—As a result of coagulation a fibrine framework is formed in the plasma which serves as the culture medium for tissue growth. This framework is necessary to hold the migrating, newly formed cells. Human fibrine is susceptible to digestion by tissue ferments and therefore human plasma makes a poor culture medium. Lambert (*Jour. Exp. Med.*, xxiv, 367) found that the addition of fowl or pigeon plasma overcomes this difficulty and that mixed human and fowl plasma makes a medium in which human tissues can probably be grown indefinitely.

Lambert used the technique of tissue culture in order to test the comparative resistance of bacteria and human tissues to certain germicidal substances (*Jour. Am. Med. Assoc.*, lxvii, 1301). He used ten common disinfectants, and found that iodine is the only one which does not destroy tissue cells more easily than it destroys bacteria. Iodine, however, has the property of dissolving fibrine, and the fibrine framework is necessary for the healing of wounds. Therefore, iodine is not the ideal tissue disinfectant.

Preservation of Living Red Blood Cells in Vitro.—Rous and Turner (*Jour. Exp. Med.*, xxiii, 219 and 239)

found that isotonic solution of dextrose (5.4 per cent.) will prevent the injury to red blood cells which salt solution causes. They caught three parts of blood in a mixture of two parts of isotonic sodium citrate (3.8 per cent.) plus five parts of isotonic dextrose solution. The suspension may be kept in the ice box and when needed the supernatant fluid replaced by Locke's solution. Transfusion experiments on rabbits showed that such cells function perfectly well after being kept two weeks. Human red cells can be preserved *in vitro* for four weeks, so that the indications are that human blood cells can be profitably used in the same way.

MEDICINE

ALEXANDER LAMBERT and HARLOW BROOKS

Military Medicine.—As is natural with so many of the best and most ambitious scientific men of all branches of the warring nations diverted as to their chief interests to patriotic service and the problems of military medicine, medical research shows the result of the withdrawal of men of this most virile and desirable type from civil pursuits. Few Teutonic journals are now reaching America and we have little real knowledge of what is taking place in scientific Austria and Germany.

Nothing of a startlingly new type has been published along the lines of medical research from any of the warring nations, and it is highly probable that for military reasons nothing of practical nature would be widely published even if important discoveries had been made. It is well known, however, that the hospital and ambulance services have been greatly perfected, especially in France, and that they are now working with surprising efficiency on all the fronts, handling in a highly scientific way a mass of material never before dreamed of as within the possibilities of men, frequently under exposure to shell and small-arm fire.

The incidence of infections appears to have diminished, apparently due largely to the prompt use of antiseptics, in contradistinction to the former aseptic management of fresh wounds. The majority of wounds in this war appear to be caused chiefly by shrapnel and by grenades, and the theoretical expectation of a high percentage of aseptic and relatively innocent wounds from high-power rifle fire has not been realized. The modern shell seems to be especially designed to inflict as painful wounds as possible. The occurrence of tetanus has been greatly reduced by preliminary antitetanic injections. Typhoid fever still appears to have been held to an astonishingly low rate, apparently chiefly because of the antityphoid inoculations. Rumor states that among the German troops it is repeated at frequent intervals. Dysentery still remains as a very important disease factor in all military operations, and as yet no prophylactic treatment appears to avail except those general measures which, while perfectly simple and easy in civil life, in military exigencies become very difficult of enforcement. Preliminary communications from the Mt. Sinai expedition sent to Serbia for the purpose of studying typhus fever indicates that an efficient antityphus vaccine has now been produced. It is further rumored that protective vaccination against cholera is being successfully practised.

Food Economics.—One of the beneficial effects of the war has come about through the thorough study and practical application of scientific food economics. This has become necessary because of certain military conditions, though the most important studies and experiments as yet have little or nothing to do with the feeding of the soldiers. In the military ration no real attempt has been as yet made to reduce the number of calories to a possible minimum. On the contrary, in most armies, and notably in our own, the regulation ration is notoriously over-rich, oftentimes a wise and necessary provision because of the explosive character of energy liberation frequently demanded of the soldier. Furthermore, in the military the point has always been to supply a ration of extremely portable character, one not demand-

ing too elaborate cooking or other preparation, and at the same time one not likely to pall on the taste of the soldier. A considerable amount of waste is expected and fully provided for. In our own service a considerable addition to company or regimental funds is often secured by the sale or return of the superfluous rations so that funds thus realized may be utilized for luxuries or other purposes. (See also XXIV, *Sanitary Chemistry.*)

As a result of the limited and somewhat irregularly distributed amount of food materials, in Germany at least, stringent regulations have been established and a food director has been appointed who has almost absolute dictatorial powers in regard to the regulation of civilian food consumption (see also IV, Germany). As a result of investigations, based on the most scientific principles and under the direct supervision of some of the world's greatest authorities on nutrition, such as Zuntz, Rubner and others of like calibre, dietary lists have been devised which, while they give a sufficient number of calories of food value, permit of very little waste, and utilize to the very best advantage all available material. While these diets may be sufficient for the ordinary demands on vital energy, they are designedly not such as are necessary for the extraordinarily active soldier. Many food substances have been much modified and adapted to new use; for example, beets and potatoes are found to furnish a very satisfactory substitute for the flour of bread. The use of silk for sausage casings is another example of highly scientific adaptation in food preparation. The fats, the importance of which is always fully recognized by physiologists and chemists, but which in most diets, especially in those of our own prodigal country, are shamefully wasted, particularly in our army ration, are recognized as of special economic value in these conditions. The utilization of almost all conceivable forms of fats and sweets is a most striking example of strict scientific supervision. It is very doubtful if under this carefully supervised and entirely scientific utilization of food principles much real suffering among the civil population will appear, unless perchance it should be found that the food demands of the military become so much greater that their necessarily wasteful ration may cause an undue limitation of the civilian food supply.

Already, however, war prisoners in several of the belligerent countries are undoubtedly suffering not only from an insufficient dietary but also largely from an unaccustomed and to some extent an unhealthful one. This is at present a subject of international inquiry. While this same question has inevitably arisen in almost every prolonged war in which the number of military prisoners has been large and siege conditions have been established, as for example in our own Civil War, it seems likely that in the present struggle the scientific limitation and substitution of food for military prisoners has been carried to a degree not previously attempted in any war. It is difficult to obtain authentic reports of what is being done in Germany in regard to prison diet, but it is currently reported that very elaborate and detailed studies are being made along these lines, particularly in the Russian prison camps. At the conclusion of this war we shall probably be supplied with the most elaborate and conclusive articles on scientific dietetics which have ever appeared. Readers wishing to enter more deeply into the consideration of this subject are particularly referred to an address by Lusk (*Jour. Washington Acad. Sci.*, June 19, 1916).

Treatment of Nervous and Mental Shock in Soldiers.—Those familiar with the classic work of the late S. Weir Mitchell on the neuroses and other forms of nervous and mental disease which developed during our Civil War, considering how much more likely such disorders are to arise under the present much more terrible methods of warfare, will appreciate the necessity, now fully appreciated by the warring powers, for the adequate medical management of the sufferers from these disturbances. Great Britain has arranged for the segregation, classification and special treatment of this class of cases, beginning from the base hospitals and

extending back through the civil institutions at home. This should result in the return to duty of a considerable number of otherwise permanently disabled soldiers and in the conservation of many individuals who without this adequate special management might be thrown back on the population at home as dependent incompetents. It is probable that similar methods are or will be in vogue with the other nations at war.

Domestic Military Medicine.—During the recent mobilization on the Mexican border (see XII, *The Army*), many problems of a medical character have appeared, some of which show an advance in our military medical science, others of which indicate to an astonishing degree quite the opposite. Typhoid fever, as in Europe, has been shown to have become a relatively minor factor by the universal utilization of the prophylactic inoculations. Naturally, sporadic instances of typhoid have occurred, for even the most enthusiastic believer in immunization would hardly expect 100 per cent. of success in this line of work. Dysentery, as a camp disease, still remains a factor of very great importance, and while the avenues of its entrance are readily pointed out and theoretically should be readily corrected, when military authority crosses with civil problems their control becomes under our form of government incomplete and very inadequate. Paratyphoid has developed in certain camps to a very serious degree, originating apparently from few sources and dependent of course on lack of discipline and improper hygienic regulation.

Routine search for typhoid and dysentery carriers in military camps has been shown by the National Guard authorities of New York State, for example, to be an entirely practical and highly valuable procedure, and it has been demonstrated that every military cook especially should be so investigated. Unfortunately, adequate laboratory facilities are as yet largely wanting in our service, and in some states recourse to the state health departments was necessary for most of the special work of this character, a fault which should be promptly remedied. In our regular service this same fault also exists but here also an attempt is now being made properly to cope with it.

From all military encampments comes a most encouraging report as to the character and number of men now seeking service in the Medical Corps, both in the regular Army and in the militia. This tendency is well shown by the 1917 regulations pertaining to medical officers in the Reserve Officers Corps. The work of this department, however, is greatly hampered by the fact that while the responsibility for camp sanitation is put up to the medical department, it has absolutely no authority to enforce sanitary measures and for this end is entirely dependent upon the general officers or those of the line. These men unfortunately are often subordinated to politicians who are probably responsible for such fiascoes as the sending of raw troops to camp sites under unhealthy climatic conditions, inadequately equipped and without previous preparation. From all medical officers, however, comes the comforting report of intelligent and earnest coöperation on the part of most line officers, many of whom have now learned the importance and methods of modern military medicine and hygiene. It is a very regrettable fact that no member of the Medical Corps has yet become a member of the General Staff.

Poliomyelitis. — The epidemic of infantile paralysis which seems to have centered largely in and about New York City during the summer and fall (see also *Public Health, infra*) has presented apparently the most serious hygienic problem of the year, not, however, in point of the number of deaths, for relatively these have been few as compared with the customary toll of such accepted juvenile diseases as diphtheria, measles and scarlet fever. The mystery of this disease, however, while actually no greater than that involved in the etiology of measles, scarlet fever or mumps, has struck the public interest largely because of the crippling so likely to follow. Little or nothing is known as yet as to the method by which the disease is spread. That it is transmissible by

direct contact and that the chief if not the sole personal infectious medium is the secretions of the naso-pharynx appears to be reasonably established. Numerous instances, however, are on record in which infection by these means appears to have been impossible and the very widespread character of the infection in the late epidemic appears to emphasize that this is by no means the sole manner of infection. That carriers exist appears to be unquestionable, but just what these may be seems to be most difficult of solution. Apparently healthy persons attendant upon active cases of the disease may carry the infection to susceptible subjects without themselves having the disease, even when the usual precautions of quarantine visitation to prevent this result are practiced. Adult carriers seem to be one if not the most important factor in the dissemination of the disease. Perhaps this fact is the chief reason why the measures attempted by certain localities to fend against the infection as an infantile disease have proved in general so inadequate.

Research as yet has added very little to our real knowledge of etiology, mostly given us as a result of the studies of Noguchi and of Flexner (*A. Y. B.*, 1913, p. 716), and we can only state that the chief or sole infectious agent is apparently contained in the naso-pharyngeal secretions and in the cerebro-spinal fluid, that it is filterable, that is, it will pass through the pores of the Pasteur filter, and that it is ultra-microscopic, unless indeed the refractile bodies described by Flexner in one of his original articles on the subject are the organism. Some recent work, as yet unsatisfactorily corroborated, seems to indicate that the virus is present also in the mesenteric lymph nodes, King suggesting a possible inoculation *via* the intestinal tract. (See also *Pathology and Bacteriology, supra.*)

Dixon has conducted some experiments tending to indicate that the ordinary house fly may act as a carrier of the disease. If these experiments are confirmed they will go a long way to explain the apparently sporadic outbreaks of the disease and especially those epidemics or isolated instances which originate and thrive in country places where the fly problem is as a rule more insistent than in the cities. That the mosquito may act as a temporary and transmitting host, or perhaps the flea or the body louse, is also well within the possibilities of our professional knowledge.

As to the treatment of the disease also little has been added. The use of adrenaline suggested by Meltzer on theoretical grounds, while ingenious, has not as yet been substantiated, and Meltzer himself, as a result of his further investigation, is reported as advising against the method. Relief of pressure by lumbar puncture affords definite relief in some cases. Serum has been injected through the spinal meninges, and the use of the serum of individuals who have suffered from the infection but who have recovered is now being extensively used. Reports vary as to results. The experiment, however, is thoroughly legitimate and well worth trying out. It is the more justifiable since observation has shown that one attack absolutely protects, a fact clinically known for many years. Flexner and Lewis established the fact that this was true also of monkeys which had been experimentally inoculated with the disease. Romer and Joseph further demonstrated in the blood of these artificially inoculated animals the presence of an immunizing substance. This observation was established in man by Flexner and Lewis, who then demonstrated the protective action of the serum from immunized individuals in the experimentally induced disease. Among the first experiments with the serum of human cured cases in the treatment of the disease were those reported by Netter, who previously to this study had already conducted considerable research on the experimental types of the disease. Conclusions cannot be reached in regard to the real efficiency of this treatment, however, until it has received a general test at the hands of expert and discriminating clinicians. Throughout it must be recalled that diagnosis is very difficult and uncertain in many instances.

Sophian (*Jour. Am. Med. Assoc.*, Aug. 5, 1916, 426) concludes that the

most satisfactory treatment of the disease is purely symptomatic, though he advocates for symptomatic and diagnostic purposes lumbar puncture which by relieving cerebrospinal pressure tends to lessen the likelihood of respiratory failure, which is the most frequent immediate cause of death in acute cases.

Concerning the treatment of the resultant paralysis, wonderful advance has been made by the early employment of scientific massage, of electricity, and by muscle education. This last method has for several years past received especial attention at the Hospital and Dispensary for Joint Diseases and Deformities, New York City, where most excellent results have attended cases receiving early treatment.

Surgical measures for the correction of the resulting deformities are applicable of course especially to those numerous cases which do not come under competent medical care until the paralysis has been followed by extensive atrophy of the paralyzed members. It would seem that in the epidemic of 1916 a rather higher percentage than usual of adult cases has appeared, also of the number of instances in which the respiratory centers and the face and head instead of the extremities have been chiefly involved. In this epidemic an attempt has been made as much as possible to manage cases entirely in hospitals. Since diagnosis before paralysis appears is mostly presumptive and by exclusion, absolute hospitalization is oftentimes a very unjust and dangerous practice, as the records of practically all public contagious hospitals show even in regard to more readily diagnosable diseases.

The absurdities of our present methods of quarantine, conducted as they are mostly by politicians and amateur hygienists, have shown during the year how inadequate these methods are in the face of any serious or puzzling epidemic The necessity for a national system, cloaked with a sufficient authority and manned by a properly salaried and educated personnel, would seem to be apparent to the most dense. The use of our Public Health Service as a nucleus, associated with the Medical Corps of the Army and the National Guard, all paid commensurate with the returns of equal ability in civil practice and given full authority, would seem to be a very sensible solution, but it is doubtless too free from political possibilities to give any hope for its consummation under present conditions.

Oral Sepsis.—Since the work mentioned in the YEAR BOOK for 1914 (p. 698) on the relationship between suppurative disease of the teeth and certain forms of septic arthritis, much attention has been directed to the cure and prevention of these disorders; no doubt the naturally close association which should exist between the physician and the more ambitious type of dental surgeon has greatly stimulated the effectiveness of both. New and successful methods of treatment have been devised, and new methods of mechanical dentistry have been evolved, since it has been seen how such local conditions may very directly affect the general health. Attention has been attracted to the necessity and proper methods of dental hygiene. The programmes of the various dental societies now include many medical topics, and the same interchange of ideas and methods is taking place in the medical societies.

Gastric Ulcer.—Although it is generally admitted that many, if not most, cases of gastric ulcer demand ultimate surgical treatment, Sippey (*Jour. Am. Med. Assoc.*, May 15, 1916) reports a large degree of success from the administration of large and continuous doses of the alkalis, on the basis that the neutralization of the free HCl of the gastric juice prevents or limits the erosion or corrosive effect of this acid on the ulcer. The method seems to have given relief or cure in a very large number of cases and seems especially applicable to those numerous instances of gastric ulcer which are of such early formation or limited extent as not to demand surgical interference. The treatment, of course, is associated with the long recognized methods of rest and carefully chosen diet. That erosion is not the sole or primary manner of formation of gastric ulcer has been shown by the

elaborate experiments of Rosenow, who has experimentally produced these lesions by the intravenous injection of cultures of streptococci isolated from cases of gastric ulcer.

Blood Transfusion.—Blood transfusion is by no means a new subject, for Pepys wrote in his diary on Nov. 14, 1666, that a successful experiment in transfusion had been that day conducted, and on Nov. 21, 1667, he records further the first successful case in which the blood of a sheep had been transfused into the circulation of a "poor and debauched man" with the agreeable result that on Nov. 30 he reports: "He finds himself much better since, and as a new man." The methods of blood transfusion, however, have been of late so safeguarded, simplified and rendered accurate, and the application of the procedure has become so widespread that the matter may well be considered under recent advance in medicine.

Physiologists soon discovered that although, as in the experiment recorded by Pepys, the blood of one species might be transfused into another without serious accident, this could by no means be relied upon, and from our recent knowledge of the subject we know that it is very likely to kill. Furthermore, even blood of closely allied species, as of man injected into the ape, may be attended with very serious consequences. It was discovered further that even the blood of one entirely healthy individual injected into another such, because of chemical causes difficult as yet to explain, may induce a hemolysis causing sickness or death.

As a result, when it is found necessary to inject or transfuse the blood of one individual into another, the blood of the donor is first tested by being mingled with specimens taken from the prospective receptor, and if changes of a dangerous character follow another donor is sought. In all instances, of course, every precaution is taken first to establish the perfect health of the donor. The Wassermann reaction is tested for and, if necessary, blood cultures, counts, etc., are made in addition to the necessary tests for hemolysis.

The earlier experiments were dangerous or unsuccessful chiefly because clotting of the blood took place in the process of transfusion. Alexis Carell largely overcame this difficulty by bringing about a direct anastomosis between the vessels of donor and receptor by such cleverly devised surgical methods that clotting did not take place. Crile, Brewer and Elsberg, all well known surgeons, further simplified and perfected the method so that it became safe in the hands of any expert surgeon. Lindemann then greatly simplified the operation by indirect transfusion by the means of a number of syringes (*A. Y. B.*, 1913, p. 734; 1914, p. 705). This method has since been modified by Unger and many others. Lewissohn and Weil have perfected a still more simple method whereby the danger of clotting is obviated by mingling definite amounts of citrate with the blood to be injected. Indeed, several methods are now successfully employed, and all are sufficiently simple so that they may be performed with safety by any qualified interne.

Blood transfusion is now very extensively used after operations or accidents entailing extensive loss of blood, after or during protracted labor, in all forms of anæmia, acute or chronic, and notably in pernicious anæmia, in which the procedure with certain adaptations is our nearest approach to cure. It is used in leukemia, in certain types of nephritis, and, in short, in all conditions where the substitution of an iron-rich and normal circulating medium is advisable. Many diseases, especially typhoid fever after hemorrhage, have been thus altogether altered as to prognosis.

Lindemann and others are further using the procedure to introduce immunizing materials into the circulation. Thus, in cases where, as after hemorrhage in typhoid fever, it is advisable because of the anæmia to transfuse, donors are selected who have had their immunity against typhoid raised to the greatest possible degree by vaccination against this disease, and in cases of specific endocarditis or septicemia donors are employed who have been highly immunized against these infections. The results, which as yet leave much to be desired in some cases, are most

hopeful, and in some instances almost miraculous. In blood transfusion as at present utilized we undoubtedly have one of the most powerful weapons of modern medicine.

Acidosis.—A condition which is now exciting great interest in clinical medicine is a large group of disease processes which are characterized by a decreased degree of blood alkalinity and hence of that of the other fluids and juices of the body. Medical men are divided as yet as to the precise definition of the condition and as to the processes which are to be included as coming under this head, but the condition is sufficiently defined so that its recognition has become of great clinical utility in the management of many disease conditions, especially in nephritis and in diabetes mellitus. Relief of many of the symptoms which arise in these conditions is experienced after the administration of alkalis, the most frequently employed of which is bicarbonate of soda.

Chemical Examination of the Blood.—Our knowledge of acidosis and of many other conditions has been greatly furthered recently by perfected and simplified methods for the chemical examination of the blood, methods for which medicine is indebted chiefly to Folin, Chittenden and others of the now very aggressive school of physiological chemists. As a result of such examination it is now possible early to recognize certain forms of nephritis, previously diagnosable only when in an advanced condition. Prognosis in nephritis also is greatly assisted by these methods, and, most important of all, research along these lines bids fair to take us near to a complete understanding of the causes, prevention and successful treatment of nephritis. In pre-diabetic conditions, as well as in frank diabetes, it is now possible to recognize the imperfect metabolism of sugar from its abnormal abundance in the blood. Uric acid, urea and other nitrogenous poisons are easily detected by chemical examination, thus making it possible early to recognize gout, various forms of nephritis and hepatic or pancreatic disorders before they have become advanced beyond the point of probable relief. This method of study is just developing and it promises to become, not only a matter of common hospital practice, but of such prime necessity that it will probably come to be as much a matter of routine as the examination of the urine now is.

Campaign against Snake Poisoning.—J. Pinto (*Brazil-Medico*, July 8, 1916) describes measures of a very far reaching character designed to combat snake poisoning (ophidism) in Brazil. An institute has been founded for the study and production of antitoxins to combat the effects of snake bite. The materials found to be efficacious for this purpose are furnished free, including delivery, whenever they are needed. Statistics already collected seem to indicate that about 4,880 deaths from cobra bites alone occur annually in Brazil. A volume has been published and widely disseminated giving expert information on the recognition and proper treatment of the bites of the reptiles most frequent in these regions and defining the most satisfactory measures for protection against such accidents. At least one state in Brazil already offers a bounty for the destruction of poisonous reptiles. This volume also points out those animals which are useful either because of their destruction of poisonous varieties of snakes or of injurious insects, and is in general a highly scientific and economically valuable index of the character of medical research in Brazil.

SURGERY

George David Stewart and Herman A. Haubold

Surgical Infection.—The treatment of the phenomena grouped under the general head of surgical infections still presents a baffling problem. The short period of time which elapses between the introduction of the infective bacteria and the evidence of grave general disease is so short, that preventive measures must be applied very promptly if any hope of obviating menacing conditions is to be realized. When it becomes possible immediately

to sterilize all wounds, surgical infections will disappear. This means, of course, that the bacteria must be immediately destroyed. It is true that the destruction of infective bacteria has been attempted, and much has been furnished the surgical literature in this connection during the last 30 years. The problem has been attacked from the viewpoint that the bacteria may be destroyed in the wound; it has been attempted also to increase the resistance of the host, so that antibodies may be readily formed and the bacteria destroyed in this way. The year 1916 has not furnished us with new means of solving the problem by the latter method. As regards the former, however, it has given opportunity for observation of the results of the use of chlorine as evolved from Dakin's solution, and from these has been determined the cause of some of the failures and some of the actually unfavorable effects following its use. The chief cause of failure would seem to be lack of accuracy in the technique of preparing the solution and the use of its constituents, in which the chemical elements occur in varying proportions. Carrel, as the result of carefully conducted observations made in connection with the treatment of the wounded of the French Army, writes from Hôpital Temporaire 21, Rond-Royal, Compiegne, France (*Jour. Am. Med. Assoc.*, Dec. 9, 1916), "I take pleasure in sending you the description of the technic which is used in my hospital for the making of the solution." Daufresche, one of Carrel's assistants is credited in the communication from Carrel with formulating methods of titrating the lime, sodium carbonate and sodium bicarbonate used in preparing the solution, and also of testing for alkalinity. The description of these methods is too voluminous to permit of reproduction here; for them the reader is referred to the original article. The formula for preparing Dakin's solution itself, as given by Daufresche, is as follows:

The solution of sodium hypochlorite, for surgical use, must be free from caustic alkali, and must contain no more than 0.45 to 0.50 per cent. of hypochlorite. Below 0.45 per cent. the solution is not sufficiently active; above 0.50 per cent. it becomes irritating.

With chloride of lime (bleaching powder) containing 25 per cent. of active chlorine, the necessary substances to prepare 10 litres of the solution are the following:

Chloride of lime (bleaching powder, 25 per cent. Cl act.)	154 gm.
Sodium carbonate, dry (soda of solway)	77 gm.
Sodium bicarbonate	62 gm.

Into a 12-litre flask, place the 154 gm. of chloride of lime and add 5 litres of water, shake vigorously for a few minutes and stand aside for from six to 12 hours (one night, for example). At the same time, dissolve in 5 litres of cold water the bicarbonate and carbonate of soda, and stand this aside from six to 12 hours. At the end of this period of time, pour the soda solution into the flask containing the now macerated chloride of lime; shake vigorously for a few minutes and again stand aside to allow the calcium carbonate (which is now formed) to precipitate. In about half an hour siphon off the liquid and filter through double paper.

The fact has been brought out that the chlorine-generating capacity of a given quantity of the solution is soon exhausted, and for this reason it must be constantly replenished. The use of the ordinary wet dressing, or the submersion of a limb in the solution, does not accomplish the purpose. Much more satisfactory results are obtained by introducing into the wound a number of drainage tubes, occluded at the ends and at the sides liberally fenestrated. These are connected with an elevated irrigator containing the solution, and furnished with a stop-cock which the attendant opens at frequent intervals, causing fresh solution to deluge the wound area, thus mechanically removing debris and substituting additional chlorine-generating elements. When the infected tissue lies beneath the skin, it must be liberally incised to make accessible the bacteria-invaded areas. The use of hot hypo-chlorite solution, perhaps, has led to more unfortunate results than has faulty preparation. Great stress is laid upon the necessity of using the solution cold.

To obviate the results of improperly prepared solutions, Dakin searched the scientific literature with the view of discovering a substance which would lend itself to a method of preparing a chlorine-generating solution that would not call for the

exercise of especial care or great skill. Chloramine, reported by Cato-way, seems to meet the requirements. After chloramine is dissolved in water to saturation, the solution is slightly warmed and filtered. The clear filtrate is used in the same manner as hypochlorite. Its activity is increased by the addition of a small amount of acetic or citric acid. Like Dakin's solution, chloramine solution evolves chlorine as the result of contact with nitrogen. Its preparation does not require any skill; it does not cause irritation of the infected area; on the other hand, it does not act as quickly upon sloughing tissues as does Dakin's solution. Dakin recommends the use of sodium hypochlorite until sloughing has ceased, when it may be replaced by chloramine solution. However, under conditions making difficult the preparation of Dakin's solution, the fact that chloramine does not act as quickly upon sloughing tissue is overbalanced by its other more desirable qualities. In field surgery, where sterile water is difficult to obtain, it is worthy of note that 15 grains of chloramine placed in a barrel of water, together with a small quantity of acetic acid, or the juice of one lemon, will liberate sufficient chlorine to sterilize the water; incidentally, the chlorine is given off, and a palatable beverage, free from pathogenic organisms, remains.

With regard to foreign bodies as carriers of infection, Kenneth Taylor, pathologist to the Hospital Complimentaire, v. r. 76, Ris-Orangis, France, communicates the result of his experimental work in connection with studies of wounds inflicted during the European War (*Ann. Surg. Phila.*, lxiv). Heretofore, removal of the foreign body, such as bullet, shrapnel fragment, particle of clothing, etc., was deemed the essential factor. Taylor's conclusions are, however, that:

(1) The implantation of a sterile foreign body or a small piece of sterile dead muscle alone produced no macroscopic lesions.

(2) The implantation of a foreign body infected with tetanus bacilli. *Staphylococcus aurcus, B. ærogenes capsulatus,* or streptococci, produced usually a localized abscess formation without invading the surrounding normal tissues.

(3) The addition of a small portion of dead muscle tissue in the region of the infection produced a more rapid and diffuse inflammatory process with earlier and more rapid abscess formation than the wounds containing only bacteria or those containing infected cloth.

(4) The implantation of infected cloth together with muscle tissue produced a more active and destructive lesion than the implantation of either alone. When infected with tetanus bacilli the presence of the dead muscle fragments determined a high mortality.

(5) Of the two substances, cloth and devitalized muscle, in the presence of infection, the muscle produced the more infective process.

The result of these experiments suggests that in the cleaning of fresh wounds at least as much care should be exercised to remove separated and devitalized fragments of soft tissue as is taken to remove other foreign bodies. In all operative procedures where blunt dissection is practiced, it should be remembered that torn fragments of devitalized tissue may remain to become a ready soil for the incubation of any bacteria which may gain access to the wound.

Plastic Surgery.—The injuries produced during the present war in Europe have accentuated the necessity of conserving the function of limbs and given ample opportunity for the exercise of ingenuity in devising operations to accomplish this end. Burkard (*Münch. med. Woch.*, Sept. 26, 1916) reports the case of a soldier who had lost, from freezing, all the fingers and the thumb of the right hand. Burkard cut down between the metacarpal bones corresponding to these fingers, apposed the edges of the palmar and dorsal flaps thus fashioned, and created fingers with which the patient was able to grasp effectually the handles of tools and exercise with satisfaction the function of prehension. This case presents a startling possibility with regard to making useful a part which previously was condemned to uselessness. It is not uncommon for persons to be afflicted in like manner as the result of injury, and if these cases could be restored to capacity, even in a measure, by the means employed by Burkard, the human race would be greatly benefited.

The Thyroid Body.—Surgical efforts directed toward the relief of constitutional symptoms, the outcome of disease of the thyroid body, have met with but indifferent success, for the reason that the office of this gland

as an internal secreting organ has not been clearly defined, although for some years the medical literature has been replete with observations, clinical, pathological, physiological and experimental, dealing with hypothyroidism, hyperthyroidism, thyroid-tetany, cretinism, etc. When the function of an organ is clearly understood, the extent to which it may be subjected to surgical manipulation presents no great problem. Organs concerned with furnishing the body with, so-called, internal secretions, however, are not standardizable in this simple manner, for the reason that since their functions are not clearly understood, the extent of trauma to which they may be safely subjected is also a matter of doubt. The ovaries, as organs of reproduction, are, of course, not essential to life, yet their removal is followed by such serious disturbances of general function that one must consider them as concerned in furnishing the body with an internal secretion which is necessary to health. With regard to the thyroid body, it has been proven that its accessory organs, the parathyroid and, to a certain extent, thyroid tissue itself, are essential to health, and that complete removal of these parts is followed by unfortunate results.

Nature endows the human body with a surplus of functionating cellular elements, but it would appear that no organ in the body produces such peculiar evidence of constitutional poisoning as is the outcome of over-activity on the part of the thyroid gland. Aside from the class of cases in which the thyroid gland is the seat of lesions inimical to health by their simple presence, such as tubercle, gumma, benign tumors, etc., and which call for surgical attack, this organ presents also the problem of reducing the quantity of its cellular elements *per se* by a technique that does not endanger contiguous important parts.

A number of surgeons insist that removal of this gland shall be accomplished by extra-capsular enucleation, while an equal number as firmly insist that intracapsular excision shall be practiced in all instances. If it be true, first, that the parathyroid bodies, which lie in contact with the posterior aspect of the lobes of the thyroid gland, should be left *in situ* in order to avoid tetany, and, second, that one-sixth to one-fourth of the thyroid should be left to prevent myxœdema, then the operative technique which is based on a series of anatomical studies by Pool and Falk (soon to be published), and sustained by clinical observations, offers a means which seems to meet fully the indications in operations for simple goitre. Pool's technique lessens sufficiently the thyroid tissue and avoids the recurrent nerve; at the same time it leaves sufficient functionating elements of the thyroid to obviate acute or chronic hypothyroidism.

Surgery of the Stomach.—Surgical efforts directed toward the relief of organic lesions of the stomach have not led to uniformly satisfactory results, despite the fact that surgeons have modified repeatedly the technique of the measures employed. Resection of various portions of the stomach for the relief of ulcer, with or without pyloric occlusion or with or without simultaneous gastro-enterostomy, has been widely discussed at meetings of surgical societies and in surgical literature. Whether only a triangular section of the diseased organ should be removed, or whether the entire segment of the stomach corresponding to the diseased area should be removed and subsequent gastro-gastrorrhaphy performed, has been decided by the operator from the viewpoint of whether or not he believed that every ulcer of the stomach was a potential carcinoma. Clinically, it would appear that segmental partial gastrectomy is followed by more lasting beneficial effect, though considering the many factors that influence a conception in this connection, such as constitutional complications, environment of the patient, etc., it need not be regarded as a determining one.

A correlation of accurate observations, pre-operative and post-operative, at the New York University, made by the clinician, the roentgenologist, the physiologist, and the laboratory of experimental surgery, representing a unit as applied to the

problem, guided by a single head, carried out on the same cases, and with the observations of each department controlled by the others, would seem to show that, irrespective of the viewpoint, segmental resection and end-to-end anastomosis result in a condition of affairs in which the operated stomach possesses greater motility and clearly demonstrates more satisfactory functional activity than when simple triangular resection, with or without the allied pyloric occlusion or gastro-enterostomy, or both, is performed. This lifts from obscurity, and simplifies one factor in a problem that has caused not a little diversity of opinion. The method of procedure employed in this instance, that is the correlation of various departments of a teaching institution, recommends itself to emulation.

X-ray and Radium Therapy.—The year has furnished additional evidence of the objection to the employment of the X-ray as a therapeutic agent. While the failure of X-ray in the treatment of malignant disease has been more or less accepted, and, indeed, proof of its standing in a causative relationship to the production of cancer has been convincingly presented, its use with the view of controlling the symptoms attendant upon benign tumors has continued, although it would seem quite clear that the objectionable features (other than the danger of causing malignant disease) outweigh the benefits that might accrue from its most careful application. Arthur Stein (*Med. Rec.*, June 3, 1916) presents interesting data in the latter connection. Stein emphasizes the difficulty of positively diagnosticating the exact character of tumors of the uterus except by microscopical section made after the neoplasm is removed. Many tumors of the uterus, including the findings during the operation, though clinically presenting a classic picture of fibro-myomata, are upon microscopical examination found to be malignant. Patients of this sort who are subjected to prolonged X-ray treatment are robbed of the opportunity of complete recovery which prompt and radical removal of the neoplasm would accomplish. Stein, however, sets forth an additional objection to the use of the X-ray in this class of cases, that is, the destruction of ovarian tissue sequential to the use of the ray, thus abolishing the function of the ovaries as internal secreting organs. Assuming that the ray produces a beneficial effect upon the fibro-myomata (which is extremely doubtful), its use would still be objectionable for the latter reason. The beneficial results which might arise from the use of the ray with the view of lessening overactivity on the part of certain internal secreting organs (thyroid, thymus, etc.), are counterbalanced by the difficulties presented in recognizing which particular organ is at fault and in standardizing the length of time of exposure so that harmful effects may be obviated.

With respect to radium, the observations of the year also lead to the conclusion that its usefulness in the treatment of malignant disease should be restricted to the surfaces of the body (though even here there are other and more certain methods of treatment available), more especially since it would appear that even radium may stand in a causative relationship to the spread and development of malignant disease. Indeed, it has at no time been easy to see how radioactive substances would be selective in their action as regards either cellular (epithelial) or intercellular (fibrous) elements, by destroying them, or by stimulating their growth. All the observations of the year would tend to show that radioactive substances are not endowed with this selective quality and, therefore, they are being rapidly discarded. The net result of the year's work would seem to justify the conclusion that the X-ray may be considered only as a valuable aid to diagnosis, and that its use and that of radium as therapeutic agents may be advantageously discontinued.

Mechanico-Therapy. — Mechanico-therapy has received a great impetus as a result of the large proportion of wounded soldiers Germany has been able to return to active service after the expiration of a startlingly short period of recovery. The explanation would seem to be that heretofore injured and infected parts were kept

immobilized until healing was completed, and all evidence of an active process disappeared. Throughout Germany a large number of so-called institutes of mechanico-therapy have been installed, at which convalescent soldiers have their injured joints, tendons, etc., mobilized by means of mechanical apparatus, very ingeniously designed to obviate the occurrence of deformity and limitation of function. Cases previously requiring from one to two years for complete restoration of function are now returned to the front in from three to ten months. The installation of the necessary apparatus for use in civil life is a problem of considerable magnitude; nevertheless, in view of the results obtained, an effort in this direction would probably prove of such inestimable economic value that the adoption of an extensive plan of action would speedily follow.

PUBLIC HEALTH AND HYGIENE

SELSKAR M. GUNN

Public Health Organization and Administration.—Studies by the U. S. Public Health Service of public-health organization and administration in states and cities have been continued during 1916 in coöperation with state and local health authorities. Detailed reports have been published during the year of the investigations made in the states of Florida, Illinois, Kansas, Maryland, Massachusetts, Minnesota, Nebraska, Nevada, North Dakota, Washington and West Virginia, and in the cities of Baltimore, Chicago, Columbia, S. C., Richmond, Ind., Bowling Green and St. Joseph, Mo., Toledo and Youngstown, Ohio, and Winston-Salem, N. C.

The most important survey in the field of public health published during the year, a report which should mark a distinct turning point in American health administration, was that prepared by Dr. Charles V. Chapin, "A Report of State Public Health Work Based on a Survey of State Boards of Health" (American Medical Association). The report is based on a comprehensive survey of the activities of state boards of Health throughout the country, instituted by the Council of Health and Public Education of the American Medical Association. It comprises three sections: (1) a detailed summary of the conditions and needs of each state; (2) a discussion of the general functions of state departments in general; and (3) tables of appropriations, classified activities, and a score-card rating of the activities of each individual state along each particular line of public-health effort.

The variations in the condition of public-health work in the different states are enormous, from New Mexico, which does nothing, and states like Arizona and Wyoming, which do next to nothing, to states like Florida and Pennsylvania, which do much; from anomalies in sanitary organization like Alabama, where the State Medical Association constitutes the State Board of Health, to New York, where the Department of Health has been carefully planned and built up by able men versed in sanitary affairs. *Per capita* expenditures for health purposes, excluding state tuberculosis sanitaria, range from nothing in New Mexico to between 10 and 13 cents in Pennsylvania and Maryland and over 15 cents in Florida.

The rating sheet or score card is one of the most significant and valuable features of the whole report. It attempts to score merely the functions actually performed and not the intangible quality of the performance. In the total score, Massachusetts leads with 745 out of a possible 1,000; New York comes next with 730, and Pennsylvania third with 716; there is then a drop to a group of nine states whose scores lie between 600 and 400, including Minnesota, New Jersey, Indiana, Maryland, Kansas, Vermont, Ohio, Rhode Island, and North Carolina.

Relative Values in Public Health Work.—A very important study of the activities of municipal health departments, by Franz Schneider, Jr., appeared in the January issue of the *American Journal of Public Health*. The results demonstrate that public-

health work in the United States is still in its infancy, that health departments are not supplied with anything like the necessary funds, and that health departments in a great many instances are spending their money ignorantly. A second article by Schneider, published in the same *Journal* for July, takes up in detail the question of an equitable distribution of the money appropriated for health departments, in relation to the value of their activities. The following table of final values of health-department activities is given:

	Per cent.
Control of tuberculosis	12.1
Control of venereal diseases	6.6
Control of all other communicable diseases	25.3
Infant hygiene	20.3
Privy and well sanitation	3.5
Milk control	2.7
Fly and mosquito suppression	2.4
Food sanitation	0.1
Inspection of school children	7.0
Vital statistics	5.0
Education	5.0
Dispensary and clinics	5.0
Laboratory	5.0
Total	100.0

Studies of the money actually expended by many health departments show that a great deal of the expenditure is in lines which are non-productive so far as preventing disease and premature death is concerned.

The annual report of the health department of Jacksonville, Fla., for 1915 advocates the development of the public-health nurse service of the department and the curtailment of the ordinary sanitary inspection. This suggestion is made in view of the fact that the work of public-health nurses actually prevents a great deal of unnecessary sickness, while the work of the sanitary inspectors is capable of bringing about very small reductions in such sickness. It seems probable that in the future health departments will spend their appropriations more scientifically, and bring about, even with the funds now available, greater reductions in unnecessary disease.

Public Health Education.—In July the Rockefeller Foundation announced the establishment of a School of Hygiene and Public Health as an integral part of Johns Hopkins University. The school is established in recognition of the urgent need in this country of improved opportunities for training in preventive medicine and public-health work, as the facilities for the education of those desiring to devote themselves to preventive medicine and the promotion of public health are as yet inadequate. A site was purchased in the fall and a suitable building is being erected, providing such laboratories and departments as are needed in such a school, including those of sanitary chemistry, physiology, bacteriology, protozoology, epidemiology, industrial hygiene, vital statistics, museum, library, etc. It is expected that the school will be opened in October, 1917. Dr. William H. Welch has been appointed director, and Dr. William H. Howell head of the physiological department.

Johns Hopkins University will be the eleventh institution to establish a school of hygiene and public health. The others, given in order of their organization, are connected with the University of Pennsylvania, Harvard University and the Massachusetts Institute of Technology, the Universities of Michigan, Wisconsin, and Colorado, the Detroit College of Medicine and Surgery, University and Bellevue Hospital Medical College of New York City, Tulane University, and the Universities of Minnesota and California. All of these schools have been established since 1909, and undoubtedly have been organized in recognition of the need of improved opportunities for public-health instruction.

Infantile Paralysis.—The outstanding feature of the year in public health was the severe epidemic of infantile paralysis (anterior poliomyelitis), which occurred in New York, New Jersey, Connecticut and Massachusetts to a marked degree, and was present in excess over normal in a large number of other states. The outbreak commenced in Brooklyn in May. The infection spread in a concentric manner in New York City, and in the states appeared to follow routes of travel. The disease showed no special affinity for either poor or rich, filthy or clean, white or colored, and the proportion of secondary in-

fections appears to have been very low. The mortality was generally high. In New York City, one-fourth of those afflicted died. Eighty-five per cent. of the cases in New York were in children under six years of age. Up to Dec. 12 there had been reported 8,095 cases in New York City, and the disease there and in other affected parts of the country had practically ceased.

The epidemic caused much alarm in many places and demonstrated again the fact that the unusual and mysterious disease will produce great excitement on the part of the public while the common preventable diseases will hardly produce a ripple.

Health departments were very active in their efforts to combat the disease, but were seriously hampered on account of the lack of knowledge of the exact method of transmission. Evidence is already forthcoming to show that the increased activities of health authorities, combined with the greater care taken of children by their parents, produced a marked decrease in sickness and death among children from other important diseases.

It is to be hoped that greater knowledge of the disease will come out of this disastrous epidemic and a number of important studies have been instituted by representatives of Federal, state and municipal health departments. Great progress has already been accomplished in the treatment of paralyzed children, so that they can recover the use of the parts affected. An important pronouncement on the etiology of poliomyelitis has been made (*Am. Jour. Pub. Health*, Nov., 1916) by a special committee of the American Public Health Association, composed of Dr. Haven Emerson, Commissioner of Health, New York City, Dr. Wade Frost, U. S. Public Health Service, and Dr. A. J. Chesley, Minnesota State Health Department. Among the important conclusions may be mentioned the following:

(1) The specific cause of poliomyelitis is a microörganism, a so-called virus, which may be positively identified at present only by its production of poliomyelitis in monkeys, experimentally inoculated. Experiments indicate that there is strong evidence that in nature infection may be directly spread from person to person.

Observation on the occurrence of the disease might seem, at first thought, to be inconsistent with this conception, since recognized cases can seldom be traced. However, this may be adequately explained by the lack of means for detecting mild non-paralytic cases, and by the belief that healthy "carriers" of the virus in undetected cases are considerably more numerous than frankly paralyzed cases.

(2) Many facts . . . have seemed to indicate that some insect or animal host, as yet unrecognized, may be a necessary factor in the spread of poliomyelitis; but specific evidence to this effect is lacking, and the weight of present opinion inclines to the view that poliomyelitis is exclusively a human disease, and is spread by personal contact, whatever other causes may be found to contribute to its spread.

(3) The incubation period has not been definitely established in human beings. The information at hand indicates that it is less than two weeks, and probably in the majority of cases, between three and eight days.

If these conclusions are correct, it is apparent that efficient methods, which would bring about satisfactory control of the disease, are very difficult of accomplishment, as the isolation of true cases fails to prevent the spread of infection by unrecognized cases and germ "carriers." This committee recommends the employment in poliomyelitis of the usual precautions taken with the more significant diseases spread by body discharges.

E. C. Rosenow, E. B. Towne, and G. W. Wheeler (*Jour. Am. Med. Assoc.*, Oct. 21, 1916) report the isolation of a peculiar polymorphous streptococcus from the throat and from material expressed from the tonsils in cases of poliomyelitis. They report also success in bringing about paralysis in animals inoculated with this streptococcus. In the same issue of the *Journal*, Drs. John W. Nuzum and M. Herzog report the isolation from the brain and spinal cord of cases of the disease of a microörganism which they call a micrococcus. Earlier observations by Flexner, Noguchi, and others indicated that the organism which produces the disease is a so-called filterable virus. The organisms described above are non-filterable, but perhaps represent another stage in the life cycle of the poliomyelitis microbe. The question of the cause of the disease, while ap-

parently nearing solution, cannot be considered as completely settled. (See also *Pathology and Bacteriology*, and *Medicine, supra.*)

Malaria.—Extensive malaria studies carried on from the headquarters of the U. S. Public Health Service at New Orleans have been productive of many new facts relative to the epidemiology and the habits of the *Anopheles* mosquito, the vector of the disease. Hibernation studies show that malarial parasites are not carried over from fall to spring in the body of the mosquito. The plasmodium remains latent during the winter in the blood of man, who reinfects new crops of mosquitoes each year. Some interesting observations of practical importance regarding anopheles as carriers of malaria were made also during field investigations relative to the limits of their flight. In one instance it was seen that *Anopheles quadrimaculatus*, both males and females, are capable of flying a distance of 3,000 ft.

In a recent paper by Asst. Surg.-Gen. J. W. Trask (*Am. Jour. Pub. Health*, Dec., 1916), relative to the present distribution of the disease in the United States, it is shown that perhaps there is no state in the Union in which the disease is not present and in which it is not spread by mosquitoes grown locally. Trask states that the disease constitutes one of the big national health problems, and also an economic problem of importance.

Hay Fever.—Due to the unceasing energy of the American Hay-Fever Prevention Association, under the leadership of Dr. W. Sheppegrell of New Orleans, the medical profession and public-health officials have given increased attention to the eradication of the causes of this affliction. The importance of this work can be realized when it is known that probably two per cent. of the people of this country are sufferers from hay fever. Efforts are being made to have state legislatures enact laws to provide means for fighting weeds which are known to produce the disease.

Pellagra.—Researches in pellagra conducted by the U. S. Public Health Service under the direction of Surg. Joseph Goldberger have demonstrated during the year that this disease can be both prevented and cured by means of a properly balanced diet containing an adequate amount of protein or nitrogenous food; and the disease has been produced experimentally in man by a diet lacking in protein material (*Jour. Am. Med. Assoc.*, lxvi, Feb. 12, 1916). Subsequent studies by Goldberger on the transmissibility of pellagra, in which he attempted experimentally the transmission of the disease to the human subject, revealed the fact that such experiments furnished no support for the view that pellagra is a communicable disease; they materially strengthened the conclusion that it is a disease essentially of dietary origin, brought about by faulty, probably "insufficient" diet (*Public Health Reports*, xxxi, No. 46, Nov. 17, 1916). The results of these experiments have attracted widespread attention and physicians and health officers are making practical application of the results in localities where the disease is prevalent.

Plague.—After extensive work throughout the world by the U. S. Public Health Service and Australian and Japanese sanitarians on plague, it now appears that the evidence is sufficiently conclusive to justify ignoring the possibilities of long-range flea transmission and to permit the centering of all anti-plague effort directly upon the rat. The logical deductions, put forth by Surgeon Creel, U. S. Public Health Service, from certain now thoroughly demonstrated facts regarding plague are: (1) Bubonic plague is essentially a disease of rodents. (2) Once introduced into rodent population of any city, the eradication of plague is an extremely difficult, slow and expensive task. (3) Once introduced among rodents, plague is almost certain, sooner or later, to appear among humans, but this will occur in any considerable number only after the epizoötic becomes very widespread and in places where close joint occupancy of premises by man and rat is marked. Considerable light has been thrown on the migration of rats by experiments in New Orleans. The results show that the intraurban travel of rats is widespread.

The finding of infected rodents has necessitated the continuance throughout the year of the U. S. Public

Health Service plague-suppressive measures in New Orleans (*A. Y. B.*, 1914, p. 707; 1915, p. 705), although the last human case of the disease occurred on Sept. 8, 1915. Plague-preventive operations have been conducted also as in previous years at Seattle, and in central California, where plague-infected squirrels continue to be found at intervals. (*Am. Jour. Pub. Health*, March, 1916; *Public Health Reports*, June 4, 1916.)

Yellow Fever.—On June 14 a commission constituted by the Rockefeller Foundation sailed from New York for various ponts in South America where yellow fever was reported still to exist. Its purpose, as stated in the official announcement, was to "make surveys of the infected regions for the purpose of determining the doubtful endemic centers and of ascertaining what measures may be necessary and feasible for the eradication of the infections in those communities on which the responsibility for the presence and spread of yellow fever is found to rest." The commission was headed by Gen. William C. Gorgas, U. S. A., and associated with him were Asst. Surg.-Gen. Henry R. Carter, U. S. Public Health Service; Dr. Juan Guiteras, head of the Cuban Public Health Service; Maj. Theodore C. Lyster, U. S. A.; Maj. Eugene R. Whitmore, M. C., U. S. A.; and Sanitary Engineer W. D. Wrightson, U. S. Public Health Service. The route of the commission was planned as follows: first to Caracas, Venezuela, then to Colon, and after crossing the Isthmus to proceed down the western coast of South America, stopping at Guayaquil, Ecuador, and Manaos, Pernambuco, and Bahia, Brazil.

Rocky Mountain Spotted Fever.—Surg. Lunsford D. Fricks of the U. S. Public Health Service announced early in the year (*Public Health Reports*, March 3, 1916) that he had been able, by the use of anærobic methods, to cultivate from the blood of guinea pigs infected with Rocky Mountain spotted fever certain bodies, probably of a protozoan nature, which he believed might bear some definite relationship to the disease. These bodies were found in the blood of human beings, guinea pigs and white rats suffering from this disease. If this blood is stained by a certain method, the bodies appear as small, extra-corpuscular granules. These granules were most numerous in and around the endothelial cells of the smaller blood vessels. Dr. Fricks reports that the ticks which convey Rocky Mountain spotted fever pass the earlier cycles of their lives on chipmunks, ground squirrels and other small animals, migrating later to larger animals. (See also *Pathology and Bacteriology, supra*).

Trachoma.—Trachoma work in the Appalachian Mountains has been continued by the U. S. Public Health Service, and the establishment of numerous small hospitals for the treatment of this disease among the mountaineers is but one of the beneficial results that have been secured. Trachoma surveys made among school children in Arkansas and Arizona showed a widespread distribution of the disease in these states, and also indicate that it is more prevalent in rural than in urban communities.

Anthrax.—Further measures for the exclusion of anthrax from dissemination in this country were instituted by the Treasury Department and Department of Agriculture by the establishment of new rules and regulations, effective Jan. 1, 1917. These rules are directed against imported hides. Hides from foreign countries, not shown officially to be free from anthrax, will not be allowed admittance, unless certified to have been immersed in 1:1,000 solution of mercuric chloride for 24 hours, instead of 30 minutes as under present regulations. Hides in bales, unless accompanied by certificate of freedom from anthrax or certificate of proper disinfection, will be admitted only if such bales have been whitewashed under official supervision, and if the importers agree to ship them in customs-sealed cars to the tannery where suitable disinfection will take place. Sun-dried hides, officially certified to be free of anthrax, will be admitted without disinfection. The regulations apply also to foot-and-mouth disease and rinderpest.

Typhus Fever.—Typhus fever has been more or less rife in Mexico, with the result that many of the southern border states feel the need of warn-

ing the local boards of health as to its possible dissemination through their communities. Mexicans come across the border and settle on vacant tracts of land and live there under the most unsanitary conditions. Local boards of health are urged to have such quarters thoroughly cleaned out. Appropriate measures to control this disease have been undertaken also by the U. S. Public Health Service in the organization and equipment of a number of new quarantine stations.

Typhoid Fever.—In April the American Medical Association published the fourth annual report of the typhoid fever mortality in those cities in the United States having over 100,000 population, covering the year 1915. The cities included in the summary numbered 60, and were divided into five classes, according to population. In the first class (cities over 500,000), Chicago had the lowest death rate per 100,000 of 5.4, while Pittsburgh was last with 24.7. In the second class (cities over 300,000), Newark, N. J., led with a rate of 2.5, with New Orleans last with a rate of 21.5. In the third group (cities over 200,000), Portland, Ore., gave a rate of 5.2, with Columbus, Ohio, last with a rate of 13.3. Group four (cities over 125,000) was led by Omaha, with a rate of 3.7, and ended with Birmingham, Ala., whose rate was 33.7. Group 5 (cities over 100,000) was led by Cambridge, Mass., with a rate of 1.8 (the lowest recorded), and ended with Nashville, Tenn., whose rate was 35.1. Forty-three cities had a lower typhoid rate in 1915 than in 1914; 32 of these had a death rate under 10 per 100,000, as compared with 24 in 1914 and 13 in 1913. It was shown that with the exception of Memphis and Albany, the average rate 1911-1915 is lower than average rate 1906-1910. Altogether the record for 1915 was most encouraging. Many American cities achieved very low typhoid rates, "so low in fact that they would have been regarded a decade ago as almost unattainable by any large city." (*Jour. Am. Med. Assoc.*, lxvi, April 22, 1916.)

Water Pollution.—The investigations of the pollution of navigable streams, begun by the U. S. Public Health Service in 1913, have been continued, and the survey of the watershed of the Ohio River has been completed. A survey begun in New Jersey in 1915 was extended during 1916 to cover all the Atlantic-coast watersheds north of the Potomac and east of the Ohio rivers, excepting, for the present, watersheds in the state of Pennsylvania. The field investigations relative to the pollution of coastal waters, which had previously covered the waters of Maryland and Virginia, including Chesapeake Bay, were continued throughout the year and extended to the coastal waters of Delaware, New Jersey, New York and Connecticut. While the principal areas where oysters are grown were found free from pollution, certain creeks and small rivers where oysters were taken to be "drinked" or "freshened" were found badly polluted with sewage materials. Studies and experiments with industrial wastes, including tannery strawboard, creamery, cannery and distillery wastes, have been made, in an effort to ascertain the best methods of treatment to prevent harmful effects on streams into which they are discharged. Sewage-disposal studies, also including experiments to determine the best method of sterilization of steamboat wastes, have been conducted and the results published.

The Schick Test.—During 1916 considerable development has taken place relative to the Schick method for the determination of antitoxic immunity to diphtheria. The presence of natural immunity to diphtheria in a large number of persons has become a well established clinical fact, such immunity being generally associated with the presence of antitoxin as shown by finding it in measurable quantities in the blood of the majority of immune individuals. Older methods for the determination of the presence of such antitoxin require much time and the use of guinea pigs. The merit of the Schick test is its simplicity and comparative ease for the determination of the presence of antitoxin immunity. The reaction depends on the local irritant action of minute quantities of diphtheria toxin when injected subcutaneously. A positive reaction shows the absence or presence in very small amounts of the antitoxin. The

great reliability of the reaction has established several facts, the most important of which are: a negative reaction after the age of two or three years indicates probably permanent protection: the test determines the efficiency of immunization, assists diagnoses of clinically doubtful cases, and seems to indicate that factors other than infection with virulent bacilli, possibly hereditary in nature, are concerned in the production of natural immunity. By applying the test immunity can be determined, thus permitting a great saving in the use of antitoxin. Much credit for the development and tests of the efficacy of this method is due to the Research Laboratory and the Willard Parker Hospital of the New York City Department of Health. (*Am. Jour. Pub. Health,* vi, May, 1916.)

Heart Disease.—An outgrowth of the increased agitation and realization of the fact that death rates from the so-called diseases of adult life have been on the increase for the last several years is found in the organization of an Association for the Prevention and Relief of Heart Disease in New York City. The programme for this Association gives promise of effective work in reducing the incidence of heart disease and so preventing much future preventable suffering and disability.

Venereal Disease Dispensaries.—Much has been done and a great deal has been written during the year relative to venereal-disease dispensaries. Many cities have, or intend to establish, clinics for the diagnosis and treatment of venereal disease, such diagnosis to be free, and treatment to be supplied at cost, or if necessary without cost. These clinics are also waging war against the advertising of "quacks," and by means of direct education are attempting to put before the public the facts relative to venereal disease, its cure, prevention and possible results. Much of the credit for the educational work along this line is due to the activities of the American Social Hygiene Association. (See also XV, *Social Hygiene.*)

Community Experiment on Tuberculosis.—The National Association for the Study and Prevention of Tuberculosis was presented with $100,000 by the Metropolitan Life Insurance Co. to demonstrate by a community experiment, lasting three years, that tuberculosis can be controlled as any other infectious disease if right methods and adequate resources are available. According to the plan, the community in which this demonstration was to take place, was to be a city or town of Massachusetts or New York of approximately 5,000 population. The population of the city had to be diversified, and preferably the town should not be a one-industry town but should have several industries. The town eventually selected was South Framingham, Mass., a small industrial town. This experiment will be watched very closely, as the results if favorable will be of great significance in connection with modern methods of combating the disease. (See also XV, *Constructive and Preventive Social Work.*)

A National Leprosarium.—Efforts have been made to get the Federal Government to have a bill passed by Congress to provide a national leprosarium for the more humane care of lepers than is possible under state and municipal administration. A bill has passed the House, and is now pending in the Senate.

Health Work in Alaska.—The U. S. Department of the Interior, through the Bureau of Education, has during the last two years successfully extended its operations in combating disease among the natives of Alaska. A well equipped hospital has been established at Juneau, and smaller ones have been established at several other points. Teachers in public schools there have been supplied with certain medical equipment which enables them, if a physician is unobtainable, to treat many of the minor diseases. (See also VIII, *Alaska.*)

Quarantine Administration.—An extension of the U. S. Public Health Service quarantine administration took place during the year by the opening of a quarantine station at Galveston, Tex., and the Boston quarantine station passed under Federal control through purchase. An officer of the Service now acts as the quarantine officer for the Port of New York through request of the state authorities.

National Baby Week.—A National Baby Week was celebrated in March, at the joint suggestion of the Children's Bureau of the U. S. Department of Labor and the General Federation of Women's Clubs. The Children's Bureau reports that they have records of 2,083 baby-week celebrations. Baby Week will be repeated in 1917 when consideration will be given not only to babies under one year of age, but also to other young children below school age. (See also XV, *Child Welfare.*)

VITAL STATISTICS

Registration Area for Deaths.—The Bureau of the Census was unable to complete the report on mortality statistics for 1915 for publication before the end of 1916. Through the courtesy of the Bureau, however, we are able to present the main features of the bulletin in press at the end of the year.

The registration area for deaths is composed chiefly of those states in which the registration under state laws is so sufficiently complete that transcripts are obtainable by the Bureau of the Census as the basis for the annual compilation of mortality statistics; but certain cities in non-registration states are also included, the registration of deaths in these cities being conducted under local ordinances. It will be seen in the table following that the registration area for deaths now embraces over two-thirds (67.1 per cent.) of the total population of continental United States, but only slightly over two-fifths (41.3 per cent.) of the land area of the country (2,973,890 sq. miles) is represented. The following table shows the growth of the registration area and the death rate therein up to the close of 1915:

REGISTRATION AREA FOR DEATHS

Year	Population of Continental United States	Registration Area for Deaths					
		Population		Land Area		Deaths from all Causes[1]	
		Number	Per Cent. of Total	Square Miles	Per Cent. of Total	Number	Rate per 1,000 Population
Census year 1879-1880	50,155,783	8,538,366	17.0	16,481	0.6	169,453	19.8
Census year 1889-1890	62,622,250	19,659,440	31.4	90,695	3.0	386,212	19.6
Census year 1899-1900	75,994,575	28,807,269	37.9	176,878	5.9	512,669	17.8
Calendar year 1900		30,765,618	40.5	212,621	7.1	539,939	17.6
Calendar year 1901	77,747,402	31,370,952	40.3	212,770	7.2	518,207	16.5
Calendar year 1902	79,365,396	32,029,815	40.4	212,762	7.2	508,640	15 9
Calendar year 1903	80,983,390	32,701,083	40.4	212,762	7.2	524,415	16.0
Calendar year 1904	82,601,384	33,345,163	40.4	212,744	7.2	551,354	16.5
Calendar year 1905	84,219,378	34,052,201	40.4	212,744	7.2	545,533	16.0
Calendar year 1906	85,837,372	41,983,419	48.9	603,066	20.3	658,105	15.7
Calendar year 1907	87,455,366	43,016,990	49.2	603,151	20.3	687,034	16.0
Calendar year 1908	89,073,360	46,789,913	52.5	725,117	24.4	691,574	14.8
Calendar year 1909	90,691,354	50,870,518	56.1	765,738	25.7	732,538	14.4
Calendar year 1910	92,309,348	53,843,896	58.3	997,978	33.6	805,412	15.0
Calendar year 1911	93,927,342	59,275,977	63.1	1,106,734	37.2	839,284	14.2
Calendar year 1912	95,545,336	60,427,247	63.2	1,106,777	37.2	838,251	13.9
Calendar year 1913	97,163,330	63,298,718	65.1	1,147,039	38.6	890,848	14.1
Calendar year 1914	98,781,324	65,989,295	66.8	1,228,644	41.3	898,059	13.6
Calendar year 1915	100,399,318	67,336,992	67.1	1,228,704	41.3	909,155	13.5

[1] Exclusive of stillbirths.

The state of Virginia was added to the registration area in 1913 (*A. Y. B.*, 1914, p. 712), and in 1914 the entire state of Kansas, all the important cities of which were already included (*A. Y. B.*, 1913, p. 746). No new states were added in 1915, but the registration area was increased by the addition of nine cities in non-registration states. At the end of 1915, the registration area comprised 25 states (in one of which,

ANNUAL CRUDE DEATH RATES PER 1,000 PERSONS LIVING, 1906–15

Area	Death Rate from All Causes[1] per 1,000 Population		
	Annual Average 1906–10	1914	1915
Registration area	15.1	13.6	13.5
Registration states[2]	15.0	13.4	13.3
Urban districts[2]	16.3	14.5	14.2
Rural districts	13.4	12.3	12.3
Registration cities in other states	15.9	16.0	16.3
All registration cities[2]	16.2	14.7	14.5
Registration states:			
California	13.9	13.6	13.7
Colorado	14.3	11.2	11.3
Connecticut	15.6	15.1	14.9
Indiana	13.0	12.9	12.7
Kansas	[3]	9.8	10.1
Kentucky	[3]	12.9	12.3
Maine	16.2	15.6	15.6
Maryland	16.0	15.9	15.8
Massachusetts	16.1	14.7	14.5
Michigan	13.6	13.4	13.4
Minnesota	[4]	10.6	10.1
Missouri	[3]	12.3	12.0
Montana	[4]	11.2	11.4
New Hampshire	17.2	16.3	16.1
New Jersey	15.4	14.2	13.8
New York	16.4	14.7	14.6
North Carolina[5]	[4]	19.0	17.3
Ohio	[4]	13.0	13.0
Pennsylvania	15.5	13.9	13.8
Rhode Island	16.7	14.7	14.8
Utah	[4]	10.1	9.9
Vermont	16.1	15.0	14.7
Virginia	[3]	14.0	14.2
Washington	[4]	8.1	8.1
Wisconsin	[4]	11.1	10.8
Registration cities of 100,000 population or over in 1910.			
Birmingham, Ala.	[4]	17.5	15.6
Los Angeles, Cal.	14.8	12.9	12.3
Oakland, Cal.	15.4	11.6	11.4
San Francisco, Cal.	16.1	15.5	15.9
Denver, Colo.	17.5	13.2	13.3
Bridgeport, Conn.	15.5	15.0	15.4
New Haven, Conn.	17.3	16.1	15.7
Washington, D. C.	19.6	16.6	18.1
Atlanta, Ga.	19.4	16.5	15.1
Chicago, Ill.	14.9	14.2	14.3
Indianapolis, Ind.	15.2	15.9	14.7
Louisville, Ky.	17.4	16.5	15.0
New Orleans, La.	21.7	20.5	21.2
Baltimore, Md.	19.5	18.1	17.1
Boston, Mass.	17.9	16.1	16.1
Cambridge, Mass.	15.1	13.2	13.1
Fall River, Mass.	19.7	17.3	15.9
Lowell, Mass.	19.4	15.9	16.2
Worcester, Mass.	17.1	15.7	15.4
Detroit, Mich.	14.8	15.6	15.7
Grand Rapids, Mich	13.3	12.9	12.5
Minneapolis, Minn.	11.0	12.0	11.5
St. Paul, Minn.	11.0	11.4	10.7
Kansas City, Mo.	14.6	14.0	14.7
St. Louis, Mo.	15.6	15.0	13.8
Omaha, Nebr.	13.8	13.8	12.2
Jersey City, N. J.	17.7	13.8	14.5
Newark, N. J.	17.2	14.5	13.1
Paterson, N. J.	15.7	13.5	13.2
Albany, N. Y.	18.6	19.4	20.0
Buffalo, N. Y.	16.0	13.5	14.9
New York, N. Y.	16.9	14.1	13.9
Rochester, N. Y.	14.7	14.3	13.9
Syracuse, N. Y.	15.2	14.8	13.2
Cincinnati, Ohio	18.1	16.0	15.6
Cleveland, Ohio	14.1	12.8	13.4
Columbus, Ohio	15.1	14.8	14.0
Dayton, Ohio	15.5	13.8	13.6
Toledo, Ohio	14.9	15.5	15.4
Portland, Ore.	10.3	9.1	8.4
Philadelphia, Pa.	17.7	16.1	15.6
Pittsburgh, Pa.	18.0	15.7	15.3
Scranton, Pa.	16.3	15.8	14.7
Providence, R. I.	17.6	15.2	14.6
Memphis, Tenn.	20.6	20.7	19.8
Nashville, Tenn.	19.3	18.4	17.2
Richmond, Va.	22.5	19.7	18.9
Seattle, Wash.	9.8	8.1	7.4
Spokane, Wash.	12.8	8.6	8.1
Milwaukee, Wis.	13.7	11.8	11.4

[1] Exclusive of stillbirths.
[2] Includes District of Columbia.
[3] Not admitted to registration area until a later date.
[4] Figures for deaths not available for the entire period, 1906–1910.
[5] Includes only municipalities having a population of 1,000 or over in 1910.

North Carolina, registration is restricted to municipalities which had 1,000 population or over in 1910), the District of Columbia, and 41 cities in non-registration states, among the latter several of the cities of Illinois. On Jan. 1, 1915, the "model law" for the registration of births and deaths went into operation in South Carolina, and the law was enacted during the same year in Florida and Illinois. In 1915 also the states of North and South Carolina were admitted to the death-reg-

istration area for 1916, increasing the estimated population of the area to 70.2 per cent. of the total for the United States in that year.

Death Rates.—The death rate of the registration area for 1912 (13.9 per 1,000) was the lowest recorded up to that time. The rate in 1913 (14.1) was slightly higher than that of 1912 but lower than any rate previously recorded. In 1914 the rate fell to the new low record of 13.6, and in 1915 the record was still further lowered to 13.5. The Bureau of the Census comments upon this exceedingly favorable record as follows:

> The death rate for 1915, 13.5 per 1,000 population, is the lowest ever recorded, the most favorable year prior to 1915 having been 1914, for which the rate was 13.6. It is markedly lower than the average rate for the five-year period 1901 to 1905, which was 16.2. The decrease thus amounts to 16.7 per cent., or almost exactly one-sixth, during a little more than a decade. When due allowance is made for the addition of many new states to the registration area between 1905 and 1915, and the comparison is confined to the group of registration states as constituted during the period 1901-5 (the present population of which is about one-fourth of the total for the country) there is still shown a very considerable decrease, from 15.9 to 14.3 per 1,000 population, or 10.1 per cent. This decrease, on the basis of the present population, would amount to 42,876 deaths. On the assumption that a corresponding reduction has taken place throughout the entire country, this would indicate a saving of approximately 170,000 lives in 1915 for the United States as a whole.

The annual crude death rates per 1,000 population, for all registration states and cities of 100,000 population or over, for the years 1906-10, 1914 and 1915, are given in the table on the preceding page. It must be remembered in comparing crude death rates that such figures are affected by peculiarities of the distribution of population. Color, race, sex, and age must be considered. An area having a large proportion of persons at the most healthful ages will normally show a lower general death rate than a population with larger proportions of very young children and of elderly persons. This caution is especially necessary in comparing the death rate for cities of 100,000 population. The rates shown for the large American cities are all low and without exception indicate a very favorable mortality. The high rates shown for Birmingham, Washington, Atlanta, New Orleans, Baltimore, and other cities of the South, are due to the large proportion of colored population, which under the conditions at present existing has practically always a much higher mortality than the white population. The low death rates shown for Seattle, Portland and certain other cities are dependent to some extent on the favorable age distribution of the population. With the report for 1911, the Bureau of the Census began the publication of "corrected" or "standardized" death rates, which permit an approximately exact comparison of the mortality of different localities in the registration area of the United States (*A. Y. B.*, 1913, p. 746).

Causes of Death.—The death rates for certain important causes of death per 100,000 population in the registration area of the United States from 1901 to 1915 are given in the accompanying table, compiled from the report of the Bureau of the Census for the year 1915.

Nearly one-third of the 909,155 deaths reported for 1915 in the registration area were due to three causes —heart diseases, tuberculosis, and pneumonia; and nearly two-thirds were charged to 12 causes—the three just named, together with Bright's disease and nephritis, cancer, apoplexy, diarrhea and enteritis, arterial diseases, diabetes, influenza, diphtheria, and typhoid fever.

That the "safety-first" campaign, inaugurated a few years ago, has borne good fruit is brought out by the figures for accidental deaths. There has been a very considerable reduction in fatalities due to railway, street-car, mine, and machinery accidents, and the increase in those resulting from automobile accidents has not been as rapid as the increase in the number of machines in use.

Birth Rates.—The collection of both birth and death statistics was authorized by the permanent Census Act, approved March 6, 1902. The Act, however, provided that the statistics should be obtained only from the registration records of such states

DEATH RATES PER 100,000 POPULATION FROM IMPORTANT CAUSES OF DEATH

Cause of Death	Annual Average, 1901 to 1905	Annual Average, 1906 to 1910	1912	1913	1914	1915
Typhoid fever	32.0	25.6	16.5	17.9	15.4	12.4
Malaria	4.8	2.6	3.1	2.5	2.2	2.3
Smallpox	3.4	0.2	0.3	0.2	0.3	0.3
Measles	9.0	10.8	7.0	12.8	6.8	5.4
Scarlet fever	11.0	10.6	6.7	8.7	6.6	3.6
Whooping cough	10.9	11.5	9.3	10.0	10.3	8.1
Diphtheria and croup	29.6	22.4	18.2	18.8	17.9	15.7
Influenza	19.9	16.4	10.3	12.2	9.1	16.0
Dysentery	8.6	6.5	4.4	5.1	4.6	3.7
Erysipelas	4.5	4.2	3.8	4.0	3.7	3.5
Rabies	0.1	0.2	0.1	0.2	0.1	0.1
Tetanus	3.5	2.7	2.2	2.2	2.1	1.8
Pellagra	[1]	0.2	1.1	1.6	2.3	4.2
Tuberculosis (all forms)	192.6	168.7	149.5	147.6	146.8	145.8
Tuberculosis of the lungs[2]	170.7	146.8	129.8	127.7	127.8	127.7
Tuberculous meningitis	8.9	9.1	8.4	8.6	8.2	8.1
Syphilis	4.1	5.4	6.5	7.2	7.9	8.6
Cancer and other malignant tumors	67.9	72.6	77.0	78.9	79.4	81.1
Diabetes	11.5	13.7	15.0	15.3	16.2	17.5
Leukemia	1.2	1.5	1.7	1.8	2.0	2.0
Alcoholism (acute or chronic)	6.1	5.8	5.3	5.9	4.9	4.4
Meningitis (total)	31.7	19.4	11.5	10.4	8.8	7.4
Acute anterior poliomyelitis (infantile paralysis)	[3]	[3]	1.9	1.4	1.1	1.0
Apoplexy	69.6	71.7	75.7	74.6	77.7	79.3
Paralysis without specified cause	20.1	16.1	10.1	10.7	9.7	9.0
Epilepsy	4.4	4.2	4.1	4.2	3.9	3.8
Diseases of the circulatory system (total)	161.2	177.7	190.3	185.9	187.8	194.2
Organic diseases of the heart	124.2	133.2	142.6	138.6	141.8	147.1
Diseases of the respiratory system (total)	220.5	188.1	165.8	164.3	157.7	162.5
Acute bronchitis	21.4	15.2	11.1	10.4	9.7	9.7
Chronic bronchitis	15.4	11.1	8.1	7.6	7.7	7.7
Bronchopneumonia	32.9	40.4	47.0	49.1	48.7	49.8
Pneumonia (total)	125.5	103.0	85.2	83.2	78.3	82.9
Pleurisy	4.6	4.1	3.3	3.5	3.7	3.4
Diseases of the digestive system (total)	195.2	193.2	158.2	163.2	151.0	141.1
Ulcer of the stomach	2.9	3.6	3.8	4.0	4.1	4.3
Diarrhea and enteritis (under 2 years)	89.0	96.2	70.3	75.2	66.0	59.5
Diarrhea and enteritis (over 2 years)	20.2	16.7	13.7	15.0	13.4	12.2
Appendicitis and typhlitis	11.0	11.2	11.6	12.1	12.3	12.5
Hernia, intestinal obstruction	13.0	12.9	11.9	11.6	11.7	11.3
Cirrhosis of the liver	14.4	14.3	13.5	13.4	12.9	12.5
Simple peritonitis (nonpuerperal)	10.8	6.1	3.2	2.7	2.8	2.3
Acute nephritis	9.6	10.1	10.6	10.4	9.0	8.9
Bright's disease	87.4	87.4	92.5	92.5	93.4	95.8
Puerperal septicemia	6.3	6.8	6.5	7.2	7.1	6.3
Suicide	13.9	16.0	16.0	15.8	16.6	16.7
Accident	84.9	86.0	82.4	85.3	78.5	76.3
Homicide	2.9	5.9	6.5	7.2	7.3	6.9

[1] Less than one-tenth of 1 per 100,000 population.
[2] Includes acute miliary tuberculosis.
[3] Not separately reported.

and municipalities as in the judgment of the Director of the Census possessed records affording satisfactory data in the necessary detail. Ever since the passage of this Act the Census bureau has made annual collections of mortality statistics from a steadily increasing area, but until recently very few of the states have maintained reliable birth-registration systems. In this respect the United States has lagged far behind a number of the leading foreign countries, in some of which (such as England, France, Germany, Norway, and Sweden) adequate birth-registration systems have been in operation for many years. A beginning was made in this country in 1915, however, and for the first time statistics are now available relating to an area having a population of such size and heterogeneity as

BIRTH RATES IN THE REGISTRATION AREA, 1915

Area	Number of Births [1]	Birth Rate [1] Per 1,000 Population	Infantile Mortality Per 1,000 Births [2]
Registration area	776,304	24.9	100
Urban areas	481,496	25.8	103
Rural areas	294,808	23.6	94
White	763,899	25.0	99
Colored	12,405	20.6	181
Registration states [3]			
Connecticut	32,627	26.7	107
Maine	16,193	21.1	105
Massachusetts	93,198	25.4	101
Michigan	80,576	26.7	86
Minnesota	55,121	24.5	70
New Hampshire	10,002	22.7	110
New York	241,836	24.0	99
Pennsylvania	217,979	26.0	110
Rhode Island	13,905	23.1	120
Vermont	7,840	21.6	85
Registration cities of 50,000 population or over in 1915:			
Bridgeport, Conn.	3,908	33.0	97
Hartford, Conn.	3,596	33.0	108
New Britain, Conn.	1,900	36.4	94
New Haven, Conn.	4,427	30.1	87
Waterbury, Conn.	2,151	25.4	143
Washington, D. C. (total)	7,027	19.6	111
White	4,814	18.5	83
Colored	2,213	22.3	173
Portland, Me.	1,392	22.1	100
Boston, Mass. (total)	19,722	26.5	103
White	19,376	26.6	103
Colored	346	21.5	159
Brockton, Mass.	1,530	23.3	82
Cambridge, Mass.	2,615	23.4	93
Fall River, Mass.	3,910	30.8	167
Holyoke, Mass.	1,605	25.1	168
Lawrence, Mass.	2,948	30.0	137
Lowell, Mass.	2,943	26.2	156
Lynn, Mass.	2,110	21.0	77
Malden, Mass.	1,177	23.5	54
New Bedford, Mass.	3,534	30.8	143
Somerville, Mass.	1,961	22.9	73
Springfield, Mass.	3,100	30.0	89
Worcester, Mass.	4,502	28.0	93
Detroit, Mich.	21,040	37.9	105
Flint, Mich.	1,245	23.9	101
Grand Rapids, Mich.	3,148	25.0	71
Saginaw, Mich.	1,075	19.6	101
Duluth, Minn.	2,094	22.8	90
Minneapolis, Minn.	8,528	24.1	71
St. Paul, Minn.	5,291	21.9	78
Manchester, N. H.	2,276	29.6	150
Albany, N. Y.	2,236	21.6	121
Binghamton, N. Y.	1,377	25.9	133
Buffalo, N. Y.	12,632	27.4	108
New York, N. Y. (total)	140,177	25.6	99
White	137,591	25.7	97
Colored	2,586	22.7	200
Rochester, N. Y.	6,768	27.0	84
Schenectady, N. Y.	2,082	21.9	96
Syracuse, N. Y.	3,536	23.2	98
Troy, N. Y.	1,445	18.6	121
Utica, N. Y.	2,413	28.8	125
Yonkers, N. Y.	2,470	25.6	109
Allentown, Pa.	1,692	27.3	139
Altoona, Pa.	1,466	25.4	91
Erie, Pa.	2,117	28.7	84
Harrisburg, Pa.	1,366	19.3	100
Johnstown, Pa.	2,175	32.7	116
Lancaster, Pa.	1,124	22.4	101
Philadelphia, Pa. (total)	40,676	24.2	104
White	38,623	24.3	100
Colored	2,053	21.2	181
Pittsburgh, Pa., (total)	16,077	28.1	110
White	15,490	28.5	108
Colored	587	21.2	162
Reading, Pa.	2,401	22.3	110
Scranton, Pa.	3,992	27.7	119
Wilkes-Barre, Pa.	2,197	29.2	120
York, Pa.	885	17.5	94
Pawtucket, R. I.	1,296	22.3	152
Providence, R. I.	5,841	23.4	106

[1] Exclusive of stillbirths. [2] Deaths of infants under one year of age. [3] Includes District of Columbia

to render them of great value and significance. In 1915 the Bureau of the Census inaugurated the annual collection of birth statistics within an area comprising the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Michigan, and Minnesota, and the District of Columbia. This area, although it represents barely 10 per cent. of the territorial extent of continental United States, has a population of approximately 31,150,000, or about 31 per cent. of the total for the country. The accompanying table gives the birth-rates and infantile-mortality rates for the calendar year 1915 in the states of the registration area and in the cities having an estimated population of 50,000 or over on July 1, 1915, the data being separated for the white and colored races in a few important cities.

International Statistics.—In the following tables, taken from the latest *Annual Report* of the Registrar-General of England and Wales, are given birth and death rates per 1,000 persons living in the principal countries for which complete and accurate statistics are available:

ANNUAL CRUDE DEATH RATES IN PRINCIPAL COUNTRIES PER 1,000 PERSONS LIVING, 1881–1914

(Annual Report, Registrar-General of England and Wales, 1914)

Countries (arranged in order of rates in 1901–5)	Quinquennial Periods						Years			
	1881–1885	1886–1890	1891–1895	1896–1900	1901–1905	1906–1910	1911	1912	1913	1914
Russia (European)	35.4	33.2	35.8	31.9	30.9	....	....	....	....	....
Chili	26.9	35.2	32.6	28.8	30.2	31.3	31.1	29.7	30.1	27.8
Ceylon	....	25.1	28.3	27.0	26.7	30.8	34.8	32.4	28.4	32.2
Hungary	33.1	32.1	31.8	27.9	26.4	25.0	25.1	23.3	....	....
Spain	32.6	30.9	30.1	28.8	26.0	24.3	23.2	21.8	22.1	22.1
Roumania	26.2	28.7	31.0	27.4	25.5	26.0	25.3	22.9	25.9	23.8
Austria	30.1	28.9	27.9	25.6	24.2	22.3	21.9	20.5	....	....
Jamaica	....	23.5	22.0	22.1	22.6	24.4	22.1	25.1	21.7	21.4
Bulgaria	17.7	18.9	27.8	23.9	22.5	23.8	21.5	....	....	....
Servia	24.5	25.9	28.9	24.8	22.4	24.3	21.8	21.1	....	....
Italy	27.3	27.2	25.5	22.9	21.9	21.2	21.4	18.2	18.7	17.9
Japan	....	20.6	21.1	20.7	20.9	21.0	20.4	....	....	....
German Empire	25.3	24.4	23.3	21.2	19.9	17.5	17.3	15.0	15.0	....
France	22.2	22.0	22.3	20.7	19.6	19.2	19.6	17.5	17.7	19.6
Prussia	25.4	24.0	22.8	21.0	19.6	17.3	17.2	15.5	14.9	....
Finland	22.2	20.0	20.5	19.0	18.0	17.4	16.5	16.3	16.1	....
Ireland	18.0	17.9	18.5	18.1	17.6	17.3	16.5	16.5	17.1	16.3
Switzerland	21.3	20.4	19.8	18.1	17.5	16.0	15.8	14.1	14.3	....
Belgium	20.6	20.2	20.1	18.1	17.0	15.9	16.4	14.8	....	....
Scotland	19.6	18.8	19.0	18.0	17.0	16.1	15.1	15.3	15.5	15.5
England and Wales	19.4	18.9	18.7	17.7	16.0	14.7	14.6	13.3	13.8	14.0
The Netherlands	21.4	20.5	19.6	17.2	16.0	14.3	14.5	12.3	12.3	12.4
Sweden	17.5	16.4	16.6	16.1	15.5	14.3	13.8	14.2	13.6	13.8
Denmark	18.4	18.7	18.6	16.4	14.8	13.7	13.6	13.0	12.5	12.6
Norway	17.2	17.0	16.8	15.6	14.5	13.8	13.2	13.5	13.2	13.5
Ontario, Province of	11.4	11.0	10.6	11.6	13.0	14.0	12.6	12.4	12.7	11.8
Australian Commonwealth	15.7	14.8	13.3	12.7	11.7	10.7	10.7	11.2	10.8	10.5
New Zealand	10.9	9.9	10.1	9.6	9.9	9.7	9.4	8.9	9.5	9.3

ANNUAL BIRTH RATES IN PRINCIPAL COUNTRIES, PER 1,000 PERSONS LIVING, 1881–1914

(Annual Report, Registrar-General of England and Wales, 1914)

Countries (arranged in order of rates in 1901–5)	Quinquennial Periods						Years			
	1881–1885	1886–1890	1891–1895	1896–1900	1901–1905	1906–1910	1911	1912	1913	1914
Russia (European)	49.1	48.2	48.2	49.3	47.7	....	40.2	....	....	....
Bulgaria	37.2	35.9	37.5	41.0	40.6	42.1	....	....	....	....
Roumania	41.8	40.9	41.0	40.2	39.4	40.3	42.3	43.4	42.1	42.5
Jamaica	....	36.8	38.6	38.9	39.0	37.5	39.0	38.8	35.3	38.9
Ceylon	....	30.3	31.7	37.2	38.8	37.5	37.9	33.3	38.6	38.1
Servia	46.3	43.7	43.3	40.1	38.7	39.1	36.2	38.0	....	....
Hungary	44.6	43.7	41.7	39.4	37.4	36.7	35.0	36.3	....	....
Chili	39.1	35.5	37.0	35.0	36.4	38.3	38.5	38.7	39.5	37.0
Austria	38.2	37.8	37.4	37.3	35.6	33.6	31.4	31.3	....	....
Spain	36.4	36.0	35.3	34.3	35.3	33.6	31.2	32.6	30.4	29.8
Prussia	37.4	37.3	36.9	36.5	34.8	32.3	29.4	28.2	28.2	....
German Empire	37.0	36.5	36.3	36.0	34.3	31.6	28.6	28.3	27.5	....
Italy	38.0	37.5	36.0	34.0	32.6	32.7	31.5	32.4	31.7	31.1
Japan	....	28.5	28.6	31.1	31.7	32.9	34.1	....	....	....
The Netherlands	34.8	33.6	32.9	32.1	31.5	29.6	27.8	28.1	28.1	28.2
Finland	35.5	34.5	31.8	32.6	31.3	30.9	29.1	29.1	27.1	....
Scotland	33.3	31.4	30.5	30.0	29.2	27.6	25.6	25.9	25.5	26.1
Denmark	32.4	31.4	30.4	30.0	29.0	28.2	26.7	26.7	25.6	25.6
Norway	31.2	30.8	30.2	30.1	28.6	26.3	25.9	25.6	25.3	25.2
England and Wales	33.5	31.4	30.5	29.3	28.2	26.2	24.4	23.8	24.1	23.8
Switzerland	28.6	27.5	27.7	28.5	27.8	26.0	24.2	24.1	23.1	....
Belgium	30.7	29.3	28.9	28.9	27.7	24.7	22.9	22.6	....	....
New Zealand	36.3	31.2	27.7	25.7	26.6	27.1	26.0	26.5	26.1	26.0
Australian Commonwealth	35.2	35.2	32.4	27.7	26.4	26.7	27.2	28.7	28.3	28.1
Sweden	29.4	28.8	27.4	26.9	26.1	25.4	24.0	23.7	23.1	22.9
Ireland	23.9	22.8	23.0	23.3	23.1	23.4	23.2	23.0	22.8	22.6
Ontario, Province of	22.4	22.0	19.9	20.1	21.8	23.7	22.6	22.4	24.0	24.0
France	24.7	23.1	22.3	21.9	21.2	19.9	18.7	19.0	19.0	18.0

XXVIII. RELIGION AND RELIGIOUS ORGANIZATIONS

CHRISTIAN CHURCHES

H. K. Carroll

BAPTIST

Southern Baptist Convention.—Four Baptist annual conventions embrace the great body of Baptists in the United States—the Northern, the Southern, the National (Incorporated), and the National (Unincorporated), the last two being colored and representing a division which took place in 1915. The Southern Baptist Convention, by far the most numerous body, reported at Asheville, N. C., that the Judson Centennial Fund of $12,500,000, described as the greatest achievement in the history of the Convention, had been completed. This fund will be applied to the equipment of the Convention's foreign missions. The chief subject of discussion was a proposition to consolidate the Home and Foreign Mission Boards. The fact that each Board reported a considerable debt may have added weight to the movement, which, however, was postponed for another year.

Northern Baptist Convention.—The Northern Convention was held in Minneapolis. Its most important action was to consolidate the Home Mission Society of New York and the Publication Society of Philadelphia. The work of the two was found to overlap in some particulars and they were merged to remove friction, on the recommendation of a committee which reported in 1915, action on its proposal having been postponed. The various boards reported a successful year, with generally increased income. Prof. Clarence A. Barbour, of Rochester, N. Y., was elected president of the Convention to succeed Prof. Shailer Mathews, of Chicago.

National Baptist Conventions.—The division which occurred in the National Baptist Convention (colored) at its meeting in Chicago in September, 1915 (*A. Y. B.*, 1915, p. 715), appears to be of a permanent character. In 1916, the two bodies met separately, one in Savannah, Ga., the other in Kansas City, Mo. They distinguish themselves in name by adding the word "Incorporated" to the title of the Savannah body, and "Unincorporated" to that of the Kansas City branch. Each has its own boards. The two Conventions have a total of about 2,000,000 communicants. (See also XV, *Social Work of the Churches.*)

LUTHERAN

Union of Norwegian Lutherans.—The outstanding event of the year 1916 in Lutheran circles in the United States was the union of three Norwegian bodies, the Norwegian Synod, Hauge's Synod and the United Norwegian Lutheran Church. The united body, which includes nearly all Norwegian Lutherans in this country, will be known as the Norwegian Lutheran Church in America. The negotiations had been on foot for some time, resulting in agreement by a joint committee on a form of constitution for union. There was a joint meeting of the three bodies in Minneapolis in May to ratify and confirm the project of union. Of the three bodies, the Norwegian Synod has been the most conservative, and Hauge's Synod the most liberal, the United Norwegians occupying middle ground. There was a minority at Minneapolis opposed to the constitu-

tion on the ground that it did not sufficiently safeguard the doctrinal interests involved. The vote for the adoption of the plan of union was 522 to 202, the latter consisting of 103 ministers and 99 laymen. The minority refused to enter the union unless the proposed constitution, which they declared showed a distinct departure from confessional Lutheranism, were modified. The particular point of difference is the statement of the doctrine of election or predestination. The "Opgjor," or agreement, does not accept the view that God arbitrarily elects certain persons unto salvation and ignores the rest, but rather that election is due to "foresight of faith." The former view, developed years ago by the Lutherans of the Missouri school, has long been a subject of controversy tending to division. The demand of the minority at Minneapolis was rejected and it is left to them to decide whether to come in or stay out. The united body will embrace about 310,000 communicants, upward of 3,000 churches, and nearly 1,300 ministers. One other Norwegian Lutheran body remains outside the united synod, the Norwegian Free Synod, with about 26,000 communicants.

Other Union Movements.—There are not wanting signs of other movements toward union. A year or so ago the Texas Synod, one of the small independent synods, became united with the General Council, which, by the exercise of much tact and diplomatic skill, has prevented the Augustana Synod from separating from it. In the latter part of 1915 and the first part of 1916, conferences were held in Minneapolis of various Lutheran elements with the object of bringing about a better understanding. Theological professors were excluded, perhaps with the idea of preventing doctrinal debate. Those participating were from the Missouri, Ohio, Iowa, Minnesota and Wisconsin synods, the second and third being large independent synods and the others members of the Synodical Conference. There were about 300 German ministers in the conference, which discussed unifying rather than divisive questions, all recognizing the value and desirability of union. Other signs of approach to common ground may be found in the fact that a Lutheran *Hymnal* has been prepared conjointly by the General Synod, the General Council and the United Synod, South, supplementing the common liturgical service in use by English-speaking Lutherans; and that the General Synod, the General Council, the United Synod, South, and the Synod of Ohio have united in the preparation of a *Lutheran Year Book*.

The Four-Hundredth Anniversary of Luther's Reformation.—All Lutheran bodies in the United States and many other Protestant communions will observe the quadri-centenary of Luther's posting of the 95 theses at Wittenberg. The particular date set is Oct. 31, 1917. A joint committee, with headquarters at 925 Chestnut St., Philadelphia, is preparing programmes, literature, lectures, etc., and urging that public meetings in commemoration be held in all communities, and has designated Oct. 31, 1916, to Oct. 31, 1917, as the celebration year. A medal has been struck representing on one side Luther and his *"Ein' feste Burg ist unser Gott,"* on the other the reformer nailing his theses to the Wittenberg church door, and the dates 1517-1917.

Lutheran Growth.—The Lutheran organizations comprise four general bodies and sixteen independent synods which do not coöperate with one another. The four general bodies embrace upward of 1,700,000 communicants out of 2,434,000. There are in all 15,269 churches and 9,688 ministers. The net increase of all Lutheran bodies in the last quarter of a century has been 1,203,000, or a little less than 98 per cent.

METHODIST

General Conference of the Methodist Episcopal Church.—The General Conference of the Methodist Episcopal Church, held at Saratoga, N. Y., enacted much important legislation. (1) It took favorable action on the subject of the unification of Methodism, approving the general principles laid down by the Joint Commission on Unification (*A. Y. B.*, 1914, p. 720; 1915, p. 718). These principles had been passed upon by the General Con-

ference of the Methodist Episcopal Church, South, in 1914, and approved, except the feature relating to the organization of a quadrennial conference for such colored bodies as might agree to enter the union. For these the Conference at Oklahoma suggested a separate and independent organization. The Saratoga Conference, with great enthusiasm and with substantial unanimity, gave a general approval of the proposed unification and appointed a commission of 25 to conduct negotiations. This commission consists of bishops, ministers and laymen. It is empowered to treat with the Methodist Episcopal Church, South, the Methodist Protestant Church, and with any other church that may desire to enter the proposed union. As indicating its desire and hope of a favorable issue, it authorized the board of bishops to issue a call for a special session of the General Conference, if necessary, after the General Conference of the Church, South, has passed upon the work of the Joint Commission in 1918. This action at Saratoga was heartily approved by the press of the Church. The view taken of it by the press of the Church, South, however, was by no means entirely favorable. One of the points of difficulty raised by southern men is that of a check on the general conference of the united body. The General Conference of the Methodist Episcopal Church is supreme in legislative power and passes upon the constitutionality of its own legislation. The General Conference of the Church, South, is subject to a modified veto lodged with the board of bishops. They may arrest proposed legislation by a written statement that they think it unconstitutional, and the General Conference must pause and consider the objection and vote again upon the measure. Other points of possible difference relate to the negro question and the territory to be included in the proposed quadrennial divisions.

(2) The Saratoga Conference continued without change the plan, adopted in 1912 (*A. Y. B.*, 1912, p. 731), dividing the country into episcopal zones or areas and continuing the superintendence of each bishop over the conferences surrounding his episcopal residence through the quadrennium, and named Detroit and Pittsburgh as additional episcopal residences.

(3) The Conference took steps to lessen competition between Church boards by an inter-board conference, and appointed a commission to report some method of coördinating the work of the Epworth League, the Sunday School and the Missionary Societies in the local churches so as to do away with overlapping and competition. It also brought the Methodist Book Concern, and the Boards of Education and Sunday Schools into close coöperative relation with the Board of Foreign Missions in its work abroad, so as to lead to a more symmetrical development of the Church in foreign lands.

(4) Three bishops having retired by the operation of the age-limit which was adopted in 1912 (*A. Y. B.*, 1912, p. 731), Bishops Cranston, Hamilton and Hartzell, and two others being retired at their own request, Bishops Harris and Scott, the Conference elected seven new bishops: Herbert Welch, college president, whose residence is to be Seoul, Korea; Thomas Nicholson, educational secretary; Adna W. Leonard, pastor; Matthew S. Hughes, pastor; William F. Oldham, missionary secretary; Charles B. Mitchell, pastor; and Franklin Hamilton, college president; and elected two missionary bishops for Africa, E. S. Johnson, white, and A. P. Camphor, colored.

(5) An amendment was adopted which, if passed upon favorably by the annual and electoral conferences, will admit laymen to the annual conference which is now composed exclusively of itinerant ministers. The Conference changed the time-honored term "probation" as relating to laymen to "preparatory membership." It reorganized the Boards of Foreign Missions and Home Missions, reducing the number of corresponding secretaries of the former from three to two and of the latter from three to one, and abolished the General Missionary Committee, a body which met annually to fix appropriations and apportionments for three boards. It set aside June, 1916, to February, 1918, as a period for the Board of

Education in which to celebrate the sesquicentennial of American Methodism, and appointed 1918-19 as a centenary year for the celebration of the inauguration of missionary work.

(6) It appointed a commission to study European conditions with a view to reporting to the next General Conference a plan of readjustment of episcopal supervision and nationalization of the Church in various countries. The Church has prosperous missions in Scandinavia, Germany, Austria, Switzerland, France, Italy, Russia and Bulgaria, and the question in some of these countries of self-support and independence is coming more and more into prominence.

(7) It adopted a revised ritual for the Lord's Supper, baptism, marriage, burial of the dead, etc. In 1912 a revision was reported which did not commend itself to the General Conference (*A. Y. B.*, 1912, p. 732). The revision reported in 1916 was conservative, the changes being comparatively few and involving no doctrine.

(8) For the fourth or fifth consecutive quadrennial session, the Conference refused to remove the catalogue of forbidden amusements from the *Discipline*. The advisory paragraph which the bishops have deemed sufficient stands, but the ban of the law remains to reinforce it.

General Conference of the African Methodist Episcopal Church.—This Conference, which came in the centennial year of the denomination, was held in Philadelphia. Two additional bishops were elected, the choice falling upon Rev. W. W. Beckett and Rev. I. N. Ross.

General Conference of the African Methodist Episcopal Zion Church.—This Conference met in Louisville, Ky. It retired Bishops Hood and Harris, and elected as new bishops Rev. L. W. Kyles, Rev. R. B. Bruce, Rev. W. L. Lee and Rev. G. C. Clement.

Growth of Methodism.—The two chief bodies, the Methodist Episcopal Church and the Methodist Episcopal Church, South, continue to increase in membership and other items, the gain of the latter reaching 66,328 in 1915, and of the former, 54,329. This is exclusive of the missions in foreign lands, which are prosperous save in Europe, where the war has interrupted their activities.

Methodism in England.—The Wesleyan Church, the mother body in England, reports another decline in membership of 4,817. In the year 1915, there was a decline of 2,369. The decrease is probably affected by the losses of men at the British front, though the period of decline covers several years. The loss in battle for the year was 5,400, not including four ministers.

PRESBYTERIAN

General Assembly of the Northern Presbyterian Church.—The General Assembly of the Presbyterian Church (Northern) organized at Atlantic City in 1916 by electing Dr. John A. Marquis moderator. Overtures were received concerning the Union Theological Seminary, New York, and the licensing of candidates alleged to be unsound in doctrine by the New York Presbytery. Some of the overtures asked the Assembly to seek in the courts a decision as to the validity of the compact of 1870 and an interpretation of the trust provisions of the Seminary. One presbytery asked that the intolerable situation in New York be ended; another, that the New York Presbytery be cut off if there was no other remedy; a third requested the Assembly to declare that the above overtures were unchristian and subversive of discipline. The Assembly adopted a recommendation that all theological seminaries affiliated with the Church be investigated by a committee of seven as to their relationship to the Church and the Assembly with a view of making the relationship more secure, uniform and mutually helpful. The Assembly of 1915 had rescinded the compact of 1870 whereby the Assembly had the power of ratifying faculties in the seminaries (*A. Y. B.*, 1915, p. 719). The Assembly of 1916 reversed this action and resumed the compact of 1870, and so avoided an open discussion of the affairs of Union Theological Seminary. With respect to the affairs of the New York Presbytery, charged with ordaining candidates not positive in their doctrinal views,

there were 26 overtures. The Assembly, however, adopted without debate the recommendation of a committee, embracing an agreement signed by leaders of the New York Presbytery, the Cincinnati Presbytery and others, recognizing that three candidates who had critical difficulties with the doctrine of the "Virgin birth" were licensed by the New York Presbytery, and agreeing that the Presbytery in licensing such candidates "should strictly observe the declarations of the *Confession of Faith* in doctrinal matters." To this agreement was added these words:

> The General Assembly renews its positive mandate with full expectation of legal compliance by all our presbyteries, that when a candidate appears who is found to be not clear and positive on any one of the fundamentals of our faith, his licensure be deferred until such time as in the judgment of the presbytery he has become so.

The Assembly's deliverance on Sabbath observance condemned the Sunday newspaper, urged families to buy nothing on Sunday, disapproved of the use of public-school buildings for community forum meetings on Sunday, and opposed all secular games on Sunday in civic life and in the U. S. Army and Navy and all unnecessary travel and excursions on that day.

All the boards presented encouraging reports. The Foreign Missions Board received $2,285,930 and reduced its debt from $101,000 to $44,500; the Home Missions Board received $1,069,674 and reduced its debt from $217,799 to $91,056; the Board of Publication had the best year in its history in sales and profits; the Board of Ministerial Relief increased its resources in four years from $2,300,000 to $4,600,000. All the other boards had large receipts. The Assembly will meet in 1917 in Dallas, Tex.

General Assembly of the Southern Presbyterian Church.—The Southern Presbyterian General Assembly of 1916, which met in Orlando, Fla., gave large attention to the question of woman's position in the Church. The action finally taken was the reaffirmation of that portion of the deliverance of 1880 which declared that the Scriptures clearly prohibit the licensure and ordination of women, who cannot therefore be admitted to the pulpits of the Church as "authorized preachers of the Word." The other part of the deliverance, which prohibited women from speaking in exhortation or leading in prayer or taking part in discussion in mixed meetings, was not reaffirmed, but in place of it the Assembly declared: "Other services of women should be left to the discretion of the sessions and the enlightened consciences of our Christian women themselves. The Assembly called attention to the fact that there is no bar to service by women equally with men in the "deacon's ministry." Some 60 commissioners presented a protest against the action of the Assembly as contrary to Paul's injunction: "Let your women keep silence in the churches; for it is not permitted unto them to speak . . . and if they will learn anything let them ask their husbands at home; for it is a shame for women to speak in the Church." The Assembly in reply said the Scriptures could be discredited not only by a violation of their precepts, but also by attempts to bind the conscience on "matters of doubtful interpretation." The Assembly provided for the reorganization of the Afro-American Synod. Its four presbyteries will have representation in the Assembly on the same basis as other presbyteries. Other presbyteries were requested to allow colored ministers and churches on their rolls to be transferred to the new synod.

Presbyterian Growth.—The larger Presbyterian Churches have reported unusually large gains in the last two years. The Northern body now has 1,560,009 communicants, a gain for the year 1916 of 46,769; the gain for the previous year was 55,155. The Southern Church has 348,223 communicants, indicating a net increase for the year of 15,884; the increase in 1915 was 21,737. The advance of the latter body in contributions was $183,992. The aggregate was $4,976,852, the largest in the last five years, with one exception. The total contributions of the Northern Church reached in 1916 the highest figure in the last five years, $28,122,426.

PROTESTANT EPISCOPAL

The General Convention.—The triennial session of the General Convention of the Protestant Episcopal Church was held in St. Louis in October. The House of Bishops elected Bishop Gailor, of Tennessee, as its president, and reëlected Dr. Samuel Hart as its secretary. The House of Deputies chose Dr. Alexander Mann of Boston to preside and Dr. Henry Anstice to serve as secretary. Joint sessions of the two houses were held from time to time to receive and discuss reports on missions, on the Church Pension Fund, social service (see XV, *Social Work of the Churches*), etc., and to receive visiting bishops. The income of the Board of Missions for the three years was reported at $4,600,000. It was shown that the annual income, which was $375,000 in 1901, when apportionment was adopted, had increased to $1,210,000 in 1916. The women's and junior auxiliaries received $469,174 in 1916, and the Sunday schools contributed $193,049. The division in the Board over its action in sending delegates to the Panama Missionary Conference (*A. Y. B.*, 1915, p. 713), resulting in the resignation of five members, including two or three bishops, was reflected to some extent in the election by the two houses of the president of the Board. The House of Bishops, acting first, reëlected Bishop Lloyd by a majority of only one. The House of Deputies gave him a clear majority, those who sympathized with the opposition to the action of the Board holding that a sufficient protest had been registered by the vote of the House of Bishops. *The Living Church*, which has voiced the objections of the minority in the Board, accepts the result as satisfactory and holds that "the division in the Church is at an end."

A report on marriage and divorce, recommending an amendment to the effect that no marriage shall be solemnized between persons either of whom has a husband or wife living who has been divorced for any cause arising after marriage, was debated at length. The present canon permits, under rigid conditions, the solemnization of marriage of the innocent party after a divorce for adultery. Few of the clergy or laity, it is said, take advantage of this permission. After a notable discussion in the House of Deputies the movement for a stricter regulation failed, the clergy strongly supporting it, while the laity by a majority of four dioceses refused to concur. The clerical vote by dioceses was 40½ for to 24¾ against, divided eight; lay, 29 for to 32¾ against, divided six. The commission was continued.

The perennial subject of Prayer-Book revision came up on a report of the commission having the matter in charge and the two houses separately considered the changes proposed, including the daily offices, special prayers and thanksgivings, the psalter and the Commandments, leaving over the marriage service and other portions. The changes agreed to, though numerous, are not revolutionary. The principle of prayers for the dead was accepted by a large majority. The bishops considered and approved many changes in the Communion service, but the deputies not having time to pass upon them, they went over to the next convention, as did unction for the sick, together with the litany, the collects, epistles and gospels, baptismal offices, confirmation, matrimony, catechism, etc. Permission was given for the use of the revised lectionary for the next three years. The changes agreed upon will be sent down to the dioceses for their information and receive final action in the next Convention.

The General Convention approved a new *Hymnal* which contains 559 hymns, instead of 679 in the present *Hymnal*. The latter book is not displaced, but may still be used by churches preferring it. Resolutions were adopted by both houses for the appointment of a joint committee to consider the question of sending representatives to the Church of England in 1917, of a commission on parochial missions, of a joint committee to prepare a *Book of Common Prayer* in Italian, of a commission to promote peace and international fellowship. They also concurred in a proposition to amend the canons by providing that tenure of office of

suffragan bishops shall not terminate with the death of the diocesan and in authorizing the House of Bishops to accept from the Church of England oversight of missionary work in Central America.

Two reports were presented by the commission on a racial episcopate. The House of Deputies adopted the recommendation of the minority, which was opposed to racial missionary districts and in favor of racial suffragan bishops. In this the House of Bishops refused to concur, so the question, long in agitation, is still unsettled. The House of Deputies refused to concur with the House of Bishops in giving suffragan bishops a full vote.

A canon taking into operation the provisions of the Church Pension Fund was adopted. It was reported that of the proposed $5,000,000 for this fund two-thirds had been raised. The balance must be secured by March 1, 1917, or the amount already promised will be lost.

The election of a missionary bishop for Liberia, Africa, was postponed, and a commission of three members was appointed to visit Liberia and also the French Sudan to report upon conditions in the two countries.

The report of the commission on faith and order stated that since 1913 28 additional commissions had been appointed to coöperate with the General Convention's commission, making a total of 58 representing various religious bodies.

The General Convention decided to take larger supervision of the Board of Missions. The Board hereafter will be under its direct control, and in the next General Convention three consecutive days are to be given, in joint session, to reports of the administrative work of the Board and the progress of the missions under its direction. The budget system is to be established and full financial reports are to be rendered.

The report of the committee on the state of the Church indicated an increase, in the past three years, of more than 70,000 communicants. The number of clergy shows little gain; baptisms and confirmations were much larger than in the previous period, and there was a gain of 19,000 Sunday-school pupils.

The House of Deputies adopted a resolution, in which the House of Bishops concurred, reaffirming its declaration of Christian liberty to Hebrew converts as set forth in its full reports of 1907 and 1910:

> Assuring our Jewish brethren that they are free to observe the national rites and ceremonies of Israel when they accept Christ, according to the clear teaching of the New Testament and the practice of Christ and the apostles; and we further urge upon the whole Church to take up earnestly, with sympathy and affection, the work of winning the ancient people of God to the kingdom and obedience of Jesus Christ.

On the subject of temperance the two houses concurred in a resolution to the effect that the General Convention, "sensible of the great evils resulting from intemperance in the use of alcoholic liquor, appeals to all the people of the Church to set the example of temperance and self-control by refraining from the use of intoxicating liquors as a beverage at all public functions and social gatherings."

ROMAN CATHOLIC

American Catholic Federation.—The convention of the Federation of Catholic Societies has come to be the central event of the year in the Roman Catholic Church so far as meetings are concerned, and the period of the convention is preëminently "Catholic week." The convention, which is held in the month of August, met in 1916 in New York. The general purpose of the Federation is to promote the civil, religious and social interests of Catholics. Its aims for the future are described as the unification of the Catholic nationalities, the banishment of divorce and socialism, the creation of Catholic public opinion on the problems of the day, and agitation of the public-school question. As to the parochial schools, it is proposed that they remain as they are; that no compensation be made for religious instruction; that if the parochial schools furnish the secular education required by the State, the State should provide compensation for it.

The total of members of the Federation is estimated at two and one-half millions. Questions discussed in the reports included the conditions in Mexico, Carranza's Government being assailed for persecution of the Church, religious work for the negro, religious prejudice, public schools, etc. John Whalen, New York, was reëlected President of the Federation, and Anthony Matre, Chicago, secretary.

Lessening Religious Prejudices.—A commission appointed by the supreme council of the Knights of Columbus to investigate the subject of religious prejudices made a long report in August, in which they quote approvingly a statement to the effect that if Catholics cannot thrive and exercise freely their powers in the United States, "they have no chance in any country," and indicate their purpose to be to promote a better understanding and peace between all religious bodies. They also advise that Catholics take an active part in all movements for the furtherance of social justice, public morals and civic righteousness. They say that religious prejudices have come down through many generations "from centuries of enmity and strife when Catholics and Protestants took turns persecuting one another and together persecuted the Jew." The prejudices of the present day are not due so much to inheritance of views of past ages, however, as to the conditions growing out of our democratic form of government, which has seemed to stimulate great numbers of societies to advocate ideals with zeal and intensity. Education is the one thing which promises most in the way of a remedy. Human nature will doubtless continue to harbor likes and dislikes and is subject only to a gradual change; but "social prejudice will yield to a systematic and persevering treatment aiming to correct misinformation." This treatment must come from Catholics for Catholics and from Protestants for Protestants and not from joint effort.

Growth of the Church.—This great communion, embracing many races, nationalities and languages, continues to expand in the United States, reporting for 1915 14 archbishops, of whom three are cardinals, 97 bishops, 19,572 clergy, 15,163 churches, and 16,564,109 Catholic population. These figures indicate an increase for the year of 578 clergy, 202 churches, and 254,799 population. The number of children in the parochial schools is 1,497,949, an increase of over 40,000.

MISCELLANEOUS

The Panama Missionary Congress.—The Panama Missionary Congress which met in Panama in February was organized to discuss questions concerning the evangelization of Latin America. The decision of the World Missionary Conference in Edinburgh, Scotland, in 1910, not to receive reports of missions in Christian countries seemed to many to make it desirable to hold a separate congress for the consideration of questions arising out of conditions in Mexico, Central and South America. The Panama meeting, which covered about ten days, was planned along lines similar to those followed by the Edinburgh Conference. Large committees considered various phases of missionary work and prepared in advance elaborate papers for presentation. The attitude to be taken toward the Church predominant in the countries under review gave much concern for two reasons, the desire to avoid unnecessary conflict with that Church, and the purpose of uniting all Protestant elements in a harmonious conference. The action of the Protestant Episcopal Board of Missions in 1915 in deciding to send delegates to the Congress met with much opposition and led to the withdrawal from the Board of several members (see *supra*, and *A. Y. B.*, 1915, p. 713). The committee of arrangements had unanimously agreed some months before the Congress met upon a statement to the effect that the purpose of the Congress should be to recognize all the elements of truth and goodness in any form of religious faith and to welcome "the coöperation of any who are willing to cooperate in any part of the programme," and not to "demand union with us in all our work as the condition of accepting allies in any part of it." This was interpreted by some

as a virtual overture to the dominant Church in South America, and a number of missionaries are said to have remained away from the Congress in consequence. The Congress itself induced the commission on coöperation and the promotion of unity to change its report somewhat by omitting two sections, which some thought went too far, and inserting in their place the following:

> Moreover, in view of the position of the Roman Catholic Church toward our evangelical work, the commission feels that any suggestion on our part of cooperation with that Church as an organization is likely to be misunderstood and to provoke responses that would tend to defeat the irenic purpose we have in our approach to all individual members of that communion who may be willing to coöperate with us in any branch of our missionary activities.

The Congress exercised full freedom of discussion on this subject. Coöperation among the societies and missionaries cultivating the field occupied much of the time and thought of the Congress. Not much was said as to the union of the denominations engaged in the work, but more as to the matter of practical coöperation, the observance of the principle of comity and delimitation of the field as far as possible. There were present nearly 500 members who represented 21 different nations or countries. The reception of the Congress was cordial and many Roman Catholics attended its sessions. A permanent committee on coöperation was appointed.

World Conference on Faith and Order.—A Conference on Faith and Order for North America, preparatory to the proposed World Conference (*A. Y. B.*, 1914, p. 716; 1915, p. 714), was held at Garden City, Long Island, Jan. 4-6. Delegates from 15 bodies, including the Alliance of Reformed Churches, were present. The Secretary presented a report stating that commissions of coöperation had so far been appointed by 57 communions, including all the more important communions, except the Roman Catholic, the Eastern Orthodox and others in Continental Europe. As to the latter, correspondence before the war indicated that the Protestant churches of the Continent were inclined to participate in the movement. Cardinal Gasparri, to whom a personal letter had been sent, represented the interest of the Pope in the movement, his zeal for the "sole and unique Church which Jesus Christ ordained and sanctified," whose door is open wide for all "who desire to gain holiness on earth and eternal happiness in heaven," and the Holy Father's hope that all disputes might be settled to the end that the unity of the faith may be furthered. The report further stated that the great mass of letters received betrayed an increasing desire for unity, but little agreement as to what unity is; an idea that other communions have little to contribute to the communion to which the writer belongs; an apparent belief that unity means uniformity; and a misunderstanding as to the function of the Conference to consider differences on various subjects, including that of orders. The preparatory Conference adopted a "Declaration and Statement of the Spiritual Basis of the World Conference," setting forth the conviction that the widespread, disastrous war in Europe will not defeat, but may indirectly promote, the object of the Conference, and affirming that the spiritual basis of the World Conference "is the faith of the whole Church as created by Christ, resting on the Incarnation and continued from age to age by His indwelling Life until He comes." The method of the Conference is "for each communion to think and act in terms of the whole." The work of the North American Preparatory Conference was declared to be initiative and preparatory, not final or determinative. Among the larger questions which the World Conference may be expected to consider are: (1) the Church, its nature and functions; (2) the Catholic creeds as the safeguard of the faith; (3) grace and the sacraments in general; (4) the ministry, its nature and functions; (5) practical questions relating to the missionary and administrative functions of the Church.

Federal Council of the Churches of Christ.—A unique organization is the Federal Council of the Churches of Christ in America, constituted in

1908 by the ecclesiastical action of 30 of the leading evangelical denominations. It officially represents these bodies on questions which do not involve denominational creeds, government, discipline or internal affairs, but which are of common interest and importance to all, such as evangelism, social service, Christian education, temperance, peace and arbitration, and Sunday observance. Among these denominations are the Baptist, Congregational, Disciples, Friends, Lutheran, Methodist, Mennonite, Presbyterian, Episcopal, the Reformed, and the United Brethren, aggregating seventeen and three-quarter million communicants, 139,000 churches and 103,000 ministers. Its Council, composed of official delegates from the several Churches, meets quadrennially. The third session was held in St. Louis, Mo., beginning Dec. 6, 1916, under the presidency of Prof. Shailer Mathews, of Chicago University. Its social-service commission, which conducts its work coöperatively through social-service organizations in the several denominations (see also XV, *Social Work of the Churches*), declares its purpose to improve social and civic conditions, to secure justice for the masses, to eradicate vice, and to bring the Church into the closest possible relations with humanity, and announces a programme including the enlistment of workingmen against the saloon, a campaign of education for the removal of the conditions which shorten human life and lower its vitality, and the promotion of the social, moral and religious interests of the laboring classes. Its peace and arbitration commission, working in harmony with the Church Peace Union and the World Alliance for Promoting International Friendship through the Churches, has been particularly active since the outbreak of the European War. It is prosecuting a programme for study in churches, Sunday schools and young people's societies of the subject of international justice and peace. Under the auspices of the Council, which has maintained unbroken correspondence during the war with the Protestant Churches of Europe, the condition and needs of European and Asiatic populations suffering from the war have been widely published and appeals made for contributions. Large amounts were secured by various organizations and forwarded for the Armenians and Syrians, Poles, Lithuanians and others. The Council's commission on relations with Japan seeks to bring the United States and Japan into closer and more friendly relations by removing misunderstandings on both sides of the Pacific. To this end it has provided literature and sought by exchange of friendly embassies to spread the truth concerning the land and labor questions which have agitated California and disturbed national feeling in Japan. Mr. Suzuki's visit to this country to represent organized labor in Japan is esteemed an important event. The commission on church and country life, designed to help country churches in critical condition, and the commission on federated movements, organized to prevent waste and rivalry by promoting coöperation between independent religious societies, made reports showing encouraging results. The national headquarters of the Council are at 105 East 22nd Street, New York, and its general secretary is Rev. Charles S. Macfarland. It has also an office in Washington which, among other things, is engaged in promoting through the chaplains, the religious and moral interests of the men of the U. S. Army and Navy. The new president of the Federal Council, elected at St. Louis, is Rev. Frank Mason North.

Church Union in Canada.—The movement for the merging into one body of the Presbyterian, Methodist and Congregational bodies of Canada (*A. Y. B.*, 1914, p. 723; 1915, p. 722) was advanced a step by the action of the Presbyterian General Assembly in June, in definitely approving the project by a vote of 406 to 88. Some amendments to the plan proposed by the Presbyterians had been accepted by the other bodies, and the Assembly not only voted to approve the union but to seek the necessary legislation from the Dominion Parliament and bring about the consummation as soon thereafter as possible. The action also provided that any congregation which has

voted against union may one year after the close of the war vote again as to whether it will enter the union. In any event, the union is not to take place until after the end of the European War. The organ of the Methodist Church says the "die is cast and Canada faces a union such as the world never saw before, a union which our fathers would have declared impossible." While it admits that union is not yet an accomplished fact, it affirms that there is nothing in sight "big enough to prevent it." General Superintendent Chown of the Methodist Church expresses profound sympathy for the Presbyterian Church, and says the "sacrificial significance" of its action "will grow as we recede from it and it will stand out as one of the moral mountain peaks in the annals" of Canada. He terms the success of the movement "a high spiritual achievement." Originally the Baptists were embraced in the project, but they concluded not to enter the union.

General Convention of the Disciples of Christ.—The annual General Convention of the Disciples of Christ was held in Des Moines, Iowa, in October. It was described as among the best attended and most enthusiastic of the series, and as indicating a great gain in harmonious feeling since the Convention was organized several years ago, when there was strong opposition to what was regarded as an innovation in the methods and principles which had so long obtained in the denomination. All the denominational interests, missionary, educational, temperance, etc., were passed in review, and a successful year was registered.

Evangelical Bodies.—The Evangelical Association and the United Evangelical Church, kindred bodies having the same origin, celebrated in the latter part of the past year the centenary of their organization. Suitable exercises were held in celebration of the erection of the first church of the denomination in New Berlin, Pa., of the organization of the printing business and the beginning of missionary work in Winfield, Pa., and the holding of the first general conference in Buffalo Valley, Pa.

Reformed Church.—At the annual meeting of the General Synod of the Reformed Church in America, held in Holland, Mich., in June, the gift of Central College, at Pella, Iowa, was accepted from the Baptists, who wish to concentrate their energies on a college 50 miles distant. The General Synod approved a plan to raise $200,000 for the endowment of Central College.

Tercentenary of the Landing of the Pilgrims.—The present is a period of celebration of big anniversaries. The 400th anniversary of Luther's reformation comes in 1917 (see *supra*), the 300th of the landing of the Pilgrims is fixed for 1920, the 150th of John Street (New York) Methodist Episcopal Church was observed in October, 1916, and the 100th of the founding of the Methodist Missionary Society is to be marked by appropriate proceedings in 1919. The tercentenary of the landing of the Pilgrims at Plymouth, Mass., is to mark for Congregationalists five achievements to be reached in the intervening years: (1) Application of Pilgrim convictions; (2) half a million new members for the churches; (3) large increase of devoted individuals for ministerial work and other forms of Christian service; (4) two million dollars annually for missions; (5) a large permanent fund as a memorial of the Pilgrims. Changes at Plymouth along the waterfront by the removal of unsightly structures are in contemplation, together with the erection of a Memorial Hall above the Rock, and the restoration of Burial Hill, where most of the Pilgrims were buried.

Work of the Y. M. C. A.—The North American Young Men's Christian Associations increased in membership during 1915 from 620,000 to 690,000; in real and personal property (net) from 89 to 92 million dollars; in annual current expenditure from 13½ to 14½ million dollars; in employed officers from 4,000 to 4,350. In all these features of progress the advance in 1916 exceeds that accomplished in 1915. In timely service to millions under arms in Europe, and to the thousands on the Mexican border, the ministry of hundreds of Y. M. C. A. secretaries has reached

prisoners of war (six millions) on both sides of the conflict, as many more men in hospitals, yet more in camps and near the trenches, and thousands on the Mexican border. The expenditure upon this unparalleled soldier work for 1916 exceeds a million dollars and will equal in men and money the expenditure by the International Committee upon the entire balance of its field in America and upon other continents than Europe.

American Bible Society Centenary.—This venerable and popular institution observed its centenary in 1916. Celebrations were held in this country and all over the world. At Washington the President and Vice-President of the United States, the Speaker of the House, and other distinguished men, made addresses, and a unique meeting was held in New York City, in the old City Hall, where the Society was organized a hundred years ago. During the century the Society has issued in America more than 71,500,000 volumes, and in other countries 46,151,000 volumes.

JUDAISM

ABRAM S. ISAACS

The Jews and the War.—Contributing their full quota to the armies of all the powers and winning their share of the war's honors, the extent of Jewish sufferings can hardly be exaggerated. They are severe in scenes of conflict on all fronts. In Transylvania, with its old Jewish settlements, in the Bukowina, with its changes of fortune, in Galicia, with its successive Russian advances which destroyed whole Jewish towns, in Serbia and now in Rumania, their fate has been appalling. Eight hundred Jews possessed the order of St. George in Russia up to September—a proof of their gallantry despite their burden of disabilities. It is estimated that the number of Jews in active service reached 600,000.

Relief for War Sufferers.—In common with all classes and creeds, the Jews of the United States have displayed much energy in the relief of their suffering brethren abroad, in addition to many liberal gifts to the general funds. Fully $6,500,000 was contributed to the American Jewish Relief Fund, and at a meeting in New York on Dec. 21 a call for ten millions was made for 1917, three millions of which was pledged on the spot. This amount has come from all elements of the Jewish community. The three joint relief committees effectively coöperated with organizations abroad for the distribution of funds in Russia, in Poland, Lithuania, and Courland under German occupation, Austria-Hungary and parts of Poland under its sway, Turkey, Salonica, Palestine, and for fugitives in Alexandria, Russo-Jews, and students in Switzerland. The profoundest interest has been evinced in the work. A Jewish Relief Tag Day was held in New York and elsewhere. Not only in the United States but also in Canada, Brazil and Argentina, the response was prompt and generous to the cry of suffering. It is noteworthy that the poorest community vied with the richest in its bounty. In England and the colonies $800,000 was collected for relief.

Good Offices of the United States Government.—On several occasions has the United States Government showed its kindly offices to war sufferers. Its latest act in this direction is the sailing of the U. S. cruiser *Des Moines* from Barcelona to Alexandria to take on board the medicines shipped by the American Jewish Relief Fund in February for the Palestine hospitals. At the request of many citizens in this country whose families were in Palestine, the cruiser has been ordered to go to Jaffa and take the wives and children aboard, for either Naples or Genoa.

Jewish Disabilities.—Much discussion has been aroused as to whether a conference or a congress be held to lead to the removal of Jewish disabilities in all lands. The American Jewish Committee, composed of representatives of recognized standing, pleaded for a conference which should deal with unjust legislation abroad, but not consider the question of Zionism. The Zionist organization, however, and some others appealed for

a Congress which, with other matters, should insist upon "national" rights in Palestine as its chief *motif*. A convention was held, committees appointed for joint action, and as concessions were made on both sides, a modified Congress will take place.

Palestine.—One effect of the war has been to direct more attention to Palestine than for many decades, and the government officials during the past two years have been stirred to much activity. While numbers of students who were aliens and expected to naturalize as Turkish subjects left for Alexandria and elsewhere, there has been a steady improvement in conditions, despite the outbreak of typhus. A new railroad has been completed connecting many towns in Palestine and Syria. This has brought a great increase in trade; Damascus and Beersheba have become close neighbors. Railroads radiate now east and west of Jerusalem. Djemil Pasha, the Turkish Governor-General, has issued orders to begin the development of the numerous arid and sandy places; Herr Wied, a German engineer, was appointed to undertake the work.

Charities and Gifts.—Among the leading gifts of the year were Louis Marshall's donation of $150,000 for the religious education of girls, in his wife's memory; a further gift of $165,000 by the family to the Guggenheim pavilion of the Mt. Sinai Hospital, New York; the new Barnert Hospital at Paterson, N. J., the $300,000 free-will offering of Nathan Barnert to the city, dedicated Oct. 24. Other Jewish hospitals, but open to all, were dedicated at Boston, Brooklyn, Hot Springs and New York. Jacob H. Schiff gave $500,000 to Barnard College, and C. A. Ratschesky of Boston $100,000 to a Jewish foundation. Julius Rosenwald of Chicago and J. H. Schiff contributed $300,000 for a new site for the Woodbine Agricultural School. The late Andrew Freedman of New York bequeathed seven millions for a Home for the Aged. Henry Kaufman, of Pittsburg, gave a million for a hospital for the crippled of New York, in his wife's memory. Mrs. Isaac L. Rice gave a million to the Beth Israel Hospital, New York, in memory of her husband. C. A. Wimpfheimer of New York contributed $150,000 to Mt. Sinai Hospital. The Federation of Rumanian Jews, of New York, announce the erection of a $200,000 Hospital for Convalescents, in memory of Dr. Solomon Schlecter.

Honors and Appointments.—After a long contest the appointment of Louis D. Brandeis of Boston as a justice of the Supreme Court of the United States was confirmed by the Senate (see I, *American History*). Abram I. Elkus of New York was made Ambassador to Turkey, in place of Henry Morgenthau, resigned. Col. Charles H. Lauchheimer of Baltimore, of the Marine Corps, was made brigadier-general. Dr. Leo Rowe of Philadelphia became secretary of the American-Mexican Commission. Hon. Nathan Barnert of Paterson, N. J., was nominated as one of the electors for his congressional district on the democratic ticket. Oscar S. Straus was appointed chairman of the Public Service Commission of New York City. Louis Einstein was appointed Minister to Bulgaria. The 80th birthday of Hon. Simon Wolf of Washington was duly celebrated on Oct. 28. Governor Alexander of Idaho was re-elected, and Governor Bamburgh elect-in Utah. Jonas Fischer was elected mayor of Williamsport, Pa.

Events Abroad.—In Russia M. Weinstein was elected to the Council of the Empire and ministerial orders gave Jews facilities in non-Pale towns. On the other hand, official circulars charged Jews with disloyalty, and the "blood accusation" was a feature in the pre-Easter week. In England, agitation arose to compel Russian-born Jews of military age to enlist, and the matter is not yet settled. Baron Reading was given a viscountcy; Herbert Samuel and Sir Edward Montague reëntered the Cabinet. In Australia, John Monash, C. B., became major-general. Germany has awarded distinction to thousands of Jewish soldiers. In France the war enthusiasm of immigrant Jews cooled off, owing to harsh treatment by anti-Semitic soldiers, but the Government refused to lend support to an anti-Semitic bill. Dr. Robert Barony of Vienna received the Nobel prize for medicine. Dr.

Yahuda was appointed professor of Rabbinics at the Central University of Madrid.

Deaths.—The necrology of the year includes Dr. Joseph Jacobs, the versatile author; Prof. R. Meldola, the scientist; Sir Nathaniel Nathan; Frug and Sholem Aleichem, Yiddish writers of prominence; M. Breal, of Paris, the philologist; Dr. Ehrlich, of Berlin, and Dr. Goldziher, of Budapest, brilliant lights in medicine and optical science, respectively; Henry Wolf, wood-engraver; Arthur Mahler of Prague, archeologist; G. Lumbroso, linguist.

RELIGIOUS BODIES IN THE UNITED STATES IN 1915[1]

The statistics reported for 1915 show an increase for the year of upward of 1,700 ministers and 653,592 communicants or members. Instead of an increase of churches, there was an apparent small decrease, due, doubtless, to revised figures. One of the interesting features of the year was the gains of churches in the South.

	Bodies	Ministers	Churches	Communicants
Adventist	6	1,233	2,742	106,347
Baptist	15	43,546	57,520	6,307,055
Brethren (Dunkards)	4	3,554	1,260	123,844
Brethren (Plymouth)	4	.....	403	10,566
Brethren (River)	3	224	105	4,903
Buddhist	2	15	74	3,165
Catholic Apostolic	2	33	24	4,927
Catholic (Eastern Orthodox)	7	338	419	467,500
Catholic (Western)	3	19,462	15,302	14,079,208
Christadelphian	..	.....	70	1,500
Christian	..	1,066	1,360	113,887
Christian Catholic (Dowie)	..	35	17	5,865
Christian Union	..	360	320	16,300
Church of Christ Scientist	..	2,828	1,414	85,096
Churches of God (Winebrennarian)	..	440	493	28,650
Churches of the Living God (Colored)	..	101	68	4,286
Churches of the New Jerusalem	2	147	151	9,713
Church Transcendent	..	2	3	144
Communistic Societies	2	.....	22	2,272
Congregational	..	5,923	6,108	771,362
Disciples of Christ	2	8,261	11,143	1,522,821
Evangelical	2	1,564	2,601	205,255
Faith Associations	9	241	146	9,572
Free Christian Zion Church	..	20	15	1,835
Friends	4	1,471	998	120,712
Friends of the Temple	..	3	3	376
German Evangelical Protestant	..	59	66	34,704
German Evangelical Synod	..	1,085	1,378	264,097
Jewish Congregations	..	1,084	1,769	143,000
Latter-Day Saints	2	4,135	1,680	397,000
Lutheran	21	9,688	15,269	2,434,184
Mennonite	12	1,476	760	61,331
Methodist	16	42,088	62,728	7,472,108
Moravian	2	149	147	21,146
Nonsectarian Bible Faith Churches	..	50	204	6,396
Pentecostal	2	890	878	33,409
Presbyterian	12	14,012	16,530	2,104,039
Protestant Episcopal	2	5,621	8,141	1,051,696
Reformed	4	2,155	2,782	502,602
Reformed Catholic	..	7	6	3,250
Salvation Army	..	2,961	941	27,664
Scandinavian Evangelical	3	629	857	72,900
Schwenkfelder	..	6	6	1,043
Social Brethren	..	15	17	1,262
Society for Ethical Culture	..	7	6	2,450
Spiritualist	..	.....	2,100	200,000
Theosophical Society	..	.....	154	4,714
Unitarian	..	512	469	70,542
United Brethren	2	2,185	4,022	360,387
Universalist	..	656	763	55,000
Independent Congregations	..	267	879	48,673
Total	..	180,604	225,333	39,380,670

[1] Prepared by H. K. Carroll.

XXIX. ART, ARCHÆOLOGY, MUSIC, AND DRAMA

PAINTING, SCULPTURE, AND HANDICRAFTS

WILLIAM B. M'CORMICK

General Tendencies.—The year 1916 will be remembered in the history of American art for the number of new art museums added to the long list of such institutions in the United States, together with the many important gifts to these new institutions and to those already established. There was a marked development of interest in the industrial aspect of the fine arts, the American Federation of Arts holding an exhibition of industrial art at the time of its annual convention in Washington, and the Metropolitan Museum of Art in New York City announcing an exhibition of a similar character, the first of its kind in that institution, to be held during the winter of 1916-1917. This industrial-art movement is one of the many effects of the European war on American economics (*cf. A. Y. B.*, 1915, p. 727).

Museums.—Seven .new museums, either complete or fairly well along toward the making, were established in the United States in 1916. Most important of these as an actual entity was the new home of the Cleveland Museum of Art which was formally opened on June 6. The building, which is of white marble and of classical design, stands in Wade Park. Grouped around the rotunda in the center of the building are two garden courts and 15 galleries and the usual offices. At the time it was opened the museum received from Mrs. Liberty E. Holden, of Cleveland, 51 old Italian and Dutch paintings purchased by her husband from James Jackson Jarves, the remainder of whose collection has been for many years at Yale University. In October the museum announced the gift of 34 paintings from Mr. and Mrs. J. H. Wade of Cleveland, mostly of the European schools with a few British and American examples, and several other art objects. On Sept. 30 was opened at Chester, Pa., the Alfred O. Deshong Memorial Museum, a small marble edifice in the style of the Italian Renaissance, with seven galleries. With the museum Mr. Deshong bequeathed to his native city his collection of paintings, numbering about 250 and representing the American collector's taste of the last half of the nineteenth century. In Memphis, Tenn., was dedicated in July the Brooks Memorial Gallery, a gift of Mrs. Bessie Vance Brooks as a memorial of her husband, the late Samuel Hamilton Brooks. The structure is of Georgia marble, 100 ft. long by 90 ft. deep, and cost $115,000. The Newport Art Association of Newport, R. I., opened a permanent home in that city in July, with seven galleries devoted chiefly to loan exhibitions. Among the new art institutions planned during the year was that of the San Francisco Art Association, which raised funds to purchase the Fine Arts Building of the Panama-Pacific Exposition and use it as the permanent home of the Association. J. Nilsen Laurvik was appointed director in May. Philadelphia proposes to erect an art museum costing $4,000,000 in Fairmount Park, with the idea of providing a suitable place to receive any of the large private collections, such as the Widener or Johnson, should they be left to the city.

The Metropolitan Museum of Art received as a gift from J. P. Morgan,

Jr., in February the famous painting known as the "Colonna Madonna" by Raphael and all the objects of Gothic art in the Hoentschel collection, both of which had been loaned to the Museum for several years by the late J. P. Morgan, Sr. It lost permanently, however, many of the objects in the world-famous Morgan Loan Collection, including 40 tapestries, the Renaissance bronzes, the Limoges enamels and the majolica ware, all of which were sold by Mr. Morgan. At the end of May the rooms devoted to the Loan Collection were closed temporarily and from them were removed the collection of miniatures and the numerous group of Meissen and Sevres porcelains, together with Venetian glass and Renaissance works in silver and ivory. The miniatures, it is reported, were taken to Mr. Morgan's country home on Long Island, and the other objects were sent to the Morgan Memorial Museum in Hartford, Conn. The new south wing of the Museum, especially built to show the Morgan collection, will be devoted in part to exhibiting the Benjamin Altman collection when completed. The museum received a bequest of nearly a million dollars from Harris Brisbane Dick, a publisher of New York City, and $25,000 from Mrs. Russell Sage for providing a permanent installation for the early American furniture owned by the institution.

The Minneapolis Institute of Arts received a gift from an anonymous donor of the collection of etchings of William M. Ladd of Portland, Ore., including 5,000 prints and valued at $225,000. From Mrs. Kate L. Dunwoody was received a bequest of a collection of paintings by American and European artists, and also $25,000 from Mrs. John R. Van Derlip and Dr. Angus Morrison for the erection of an art school. The Rhode Island School of Design of Providence, R. I., received a bequest of $1,500,000 from Miss Lyra Brown Nickerson of that city.

Sculpture.—Although there were an unusually large number of works of sculpture emplaced during 1916, the marked feature of the year in this branch of the fine arts was the exhibition arranged by the Albright Gallery in Buffalo, N. Y., in coöperation with the National Sculpture Society, in which the sculptures were shown not only in the galleries of the museum, which had been cleared of all paintings for the occasion, but also in the grounds surrounding the building. The exhibition opened on June 17 and closed Oct. 2, the attendance being beyond all records in the museum's history. About 800 works were shown, many of them coming from the Panama-Pacific Exhibition, 168 artists being represented.

A national event of first importance in this field was the emplacement of Paul Bartlett's sculptures for the pediment of the House wing of the Capitol at Washington, typifying Armed Peace protecting Genius, the industries and activities of the country, and the Atlantic and Pacific Oceans. The group was unveiled on Aug. 2. On May 17 the Secretary of War formally approved the award of the jury in the War Department's competition for the Francis Scott Key monument to be erected at Fort McHenry, Baltimore, the winners being Charles Henry Niehaus, sculptor, of New Rochelle, N. Y., and E. V. Warren, architect, of Brooklyn. In August preliminary work was begun at Stone Mountain, Ga., for the proposed colossal sculptured relief which is to be carved on the face of the mountain by Gutzon Borglum as a memorial to the heroes of the Southern Confederacy.

Among the statues emplaced during the year were: J. Massey Rhind's replica of the famous equestrian statue of Colleoni by Verrochio in Venice, unveiled in Newark, N. J., in July; Hermon A. MacNeil's full length statue of George Washington for the Washington Arch in New York City, May 28; J. Q. A. Ward's equestrian statue of Gen. Philip H. Sheridan, Albany, N. Y., Oct. 7; and Raymond Averill Porter's bronze figure of the Green Mountain Boy, Rutland, Vt., in August. A replica of H. K. Brown's equestrian statue of George Washington in New York City was presented to the U. S. Military Academy at West Point by an anonymous donor and dedicated on May 19. The bronze cavalry group for the General Grant monument, Washington,

by Henry Merwin Shrady, was completed and exhibited in Brooklyn in February. Evelyn Beatrice Longman's bronze symbolical figure of Electricity was emplaced on the tower of the new Western Union building, New York City, in November.

Arts and Crafts.—There was an unusual and markedly successful movement among the arts and crafts workers of the United States during 1916, with a broadening of the range of their activities that speaks well for the better understanding in this country of just what craftwork may grow to be for the betterment of our national art. The Boston Society of Arts and Crafts had an unusually busy year, the treasurer reporting at the annual meeting in February that the sales for the preceding year had totaled $80,000, the largest amount in the 19 years of the organization's existence. The Society awarded three medals of honor at the same meeting. The Society also revived the custom of wearing special costumes for each branch of the guild and held numerous exhibitions throughout the year, one of which was that by the Los Angeles Arts and Crafts Club, which sent its San Diego Exhibition around the country on a tour of the principal cities. Massachusetts contributed another interesting exhibition in this field through the annual show of the Hingham Arts and Crafts Society in July, at which were to be seen wooden ware, colonial toys, etc., that are an outgrowth of the wooden ware for which Hingham long has been commercially known. Ecclesiastical objects occupied a foremost place in the interests of societies of craftsmen during the year, Boston having one exhibition of these things, the National Society of Craftsmen of New York City another, while they formed the chief feature of the Exhibition of Applied Arts in Chicago in October-November.

Societies.—Three new art organizations were founded in 1916, the direct outcome of the idea back of the Friends of American Art organized in Chicago in 1910. These were: The Friends of the Albright Gallery in Buffalo, N. Y.; the Friends of Art in New Orleans, which is to be a department of the city's Art Association and is to be devoted to the purpose of buying local works of art; and the One Hundred Friends of Pittsburgh Art, an organization planning to spend up to $1,000 a year for five years in the purchase of paintings by local artists for presentation to the public schools. The American Federation of Arts, which held its annual convention and exhibition in Washington, May 17-19, was incorporated in New York State on Aug. 14, the directors including, among others, Robert W. de Forest, Florence Levy, Henry W. Kent, Cecelia Beaux, Charles W. Ames, Charles Moore and Cornelia B. Sage. At the annual election Robert W. de Forest was reëlected president; Charles L. Hutchinson, vice-president; Leila Mechlin, secretary; and N. H. Carpenter, treasurer. The annual exhibition was devoted to industrial art and continued through June 17, prizes being awarded for jewelry, pottery, iron work, wood carving and book binding. Combined with this was a memorial exhibition of the work of J. W. Alexander in the Corcoran Gallery. The Art Club of Richmond, Va., secured the passage of a bill to establish an Art Commission for the state. The annual meeting of the College Art Association of America was held at the University of Pennsylvania, April 20-21, the general subject of discussion being the study of art in the colleges. Three new members of the national Commission of Fine Arts were appointed by President Wilson in October: J. Alden Weir, Charles A. Platt and William M. Kendall, all of New York City.

Medallic Art.—Another effort to improve the artistic qualities of the coins of the United States was made during the year, when, for the first time since 1891, new designs were made for the half-dollars, the quarters and the dimes of our currency. Adolf A. Weinman modelled the designs for the 50-cent pieces and dimes, while Hermon A. MacNeil modelled the designs for the 25-cent pieces. The dimes made their first appearance in October and showed a Grecian woman on the obverse and the bundle of rods and the axe of Roman lictors on the reverse. The quarters show a design of a full figure of a woman

coming through a gate on the obverse and an eagle in flight on the reverse. The design of the half-dollars shows a full-length figure of the Goddess of Liberty holding olive branches on the obverse, that on the reverse being a spread eagle standing on a rock. The Friends of the Medallion issued a medal in honor of Joan of Arc by Allan G. Newman, bearing on the obverse a profile portrait of the Maid of Orleans and on the reverse a symbolic figure of France with an appropriate inscription. On Jan. 26 the American Academy of Arts and Letters presented to Charles W. Eliot, president-emeritus of Harvard, a gold medal designed by James W. Fraser, showing a figure of Orpheus on the obverse with the name of the institution and a winged horse on the reverse.

Exhibitions.—Souvenirs of the Panama-Pacific Exposition of 1915 were a feature of the exhibitions of paintings during 1916. These took the form of groups of national art, seen at the San Francisco fair, which in 1916 were either sent on tour around the United States or shown in one institution for a considerable period. The Swedish art exhibition, including 241 paintings, prints and sculptures, made such a tour, opening at the Brooklyn Museum, Jan. 30 - Feb. 28, and being exhibited thereafter in Boston and other cities. The Carnegie Institute showed the group of paintings from the French Luxembourg, together with works of art from the French, Belgian, Italian, and Swedish collections, all from the San Francisco fair. This exhibition opened April 28 and continued through the summer, although it was originally intended to close the show on June 30. The Guild of Boston Artists arranged an exhibition in the Museum of Fine Arts in Boston of sculptures and pictures from the Panama-Pacific Exposition. It was opened on March 7 and continued for a month. New York saw two comprehensive shows of paintings by contemporary French artists in January (in the Knoedler and Montross galleries) that were unusually representative of the work of such men as Lucein Simon, Latouche, Cottet, Carrière and Besnard. The artists associated with the Cornish, N. H., colony gave their first joint exhibition in Dartmouth College, Hanover, Jan. 8-18, more than 40 painters and sculptors being represented.

The 111th annual exhibition of the Pennsylvania Academy of Fine Arts opened Feb. 6 and continued through March 26, including 656 paintings and sculptures. Joseph T. Pearson, Jr., won the Temple Gold Medal and the Stotesbury Prize; J. Alden Weir, the Academy Gold Medal of Honor; Karl Anderson, the Lippincott prize; Nancy M. Ferguson, the Mary Smith prize; Emil Carlsen, the Jennie Sesnan gold medal; Douglas Volk, the Beck gold medal; and Edward McCarten, the Widener Memorial gold medal. The Architectural League of New York City held its annual exhibition, Feb. 5-26. Cass Gilbert was awarded the League's Medal of Honor; the medal for sculpture went to Herbert Adams, and the medal for painting to Miss Violet Oakley. The annual exhibition of the National Academy of Design opened March 18, continuing through April 23. F. E. Church won the Clarke prize; Charles Rosen the Inness gold medal and the first Altman prize; Ernest Lawson the second Altman prize; W. T. Smedley the Maynard prize; Emil Carlsen the Saltus gold medal; and Julia M. Lewis the Shaw memorial prize. The three Hallgarten prizes went to Arthur Crisp, Miss Christine Herter and John Folinsbee. The Lotus Club of New York opened its galleries on March 30 to an exhibition of paintings accepted by the Academy jury but not hung for lack of space. A rarity in the way of loan exhibitions took place in the National Arts Club, New York, March 2-25, in the form of portraits from the permanent collection of the National Academy of Design, the first time any of these portraits were ever loaned by the Academy. The winter exhibition of the National Academy of Design opened in New York on Dec. 16, the following prizes being awarded: Carnegie prize, Howard Russell Butler, N.A.; Proctor prize, Philip L. Hale; Altman prize, Lawton Parker, A.N.A.; Altman prize, E. Irving Couse, N.A.; Isidor medal, George Bellows, N.A.; Shaw Memorial prize, Marie D. Page; Elizabeth N. Watrous medal, Herbert

Adams, N.A.; Barnett prize, Laura Gardin Fraser.

The Allied Artists of America held their third annual exhibition in New York, May 2-25, with 396 paintings, studies and sketches. The Associated Artists of Pittsburgh held their seventh annual exhibition in the Carnegie Institute from Oct. 20 to Nov. 22. The Corcoran Art Gallery opened its sixth exhibition of contemporary oil paintings on Dec. 17, William A. Clark offering $5,000 for four prizes to go with the three Corcoran Gallery medals and an honorable mention. The jury awarded the Clark prizes as follows: first ($2,000), Arthur B. Davies; second ($1,500), Ernest Lawson; third ($1,000), Hugh H. Breckenridge; fourth ($500), George B. Luks. On Nov. 2 was opened the 29th annual exhibition of American paintings and sculpture at the Art Institute of Chicago, the new wing of the building being formally opened at the same time.

The Blakelock Fund.—One of the unusual events of the art year, which has no parallel in our art history, was the origin of the movement to restore Ralph Albert Blakelock to his place in the world after having been confined in the state insane asylum at Middletown, N. Y., since 1897. The movement was begun by Mrs. Van Renssalaer Adams of New York City and took the form eventually of an incorporated Blakelock Fund, the incorporators including J. Alden Weir, president of the National Academy of Design, and others interested in art museums resident in New York City. The National Academy of Design elected Blakelock a national academician on April 26 and in the same month three exhibitions of his work were held in New York, the admission fees and profits from the sales of his paintings going to the Fund. On Sept. 5 Blakelock was released from the Middletown asylum and taken by Mrs. Adams to a private sanitarium in New Jersey where he was to remain on probation for six months. In February one of his paintings, entitled "Moonlight," was sold for $20,000 at the sale of the Catholina Lambert collection.

Murals.—The important event of the year in mural painting was the revealing on Dec. 21 of John Singer Sargent's third addition to his series of mural paintings for the Public Library in Boston, the subject being the "Theme of the Madonna" in a series of paintings occupying two side niches and the strip of ceiling inclosing the "Christian end" of the great upper hall, which, as will be remembered, is devoted in the entire scheme of the decorations to "Judaism and Christianity." The Madonna theme is represented by the "Ancilla Domini" and the "Mater Dolorosa," the 15 "Mysteries of the Rosary" surrounding these. On either side of the hall are three lunettes, one set being devoted to Judaism, the subjects being "The Law," "Gog and Magog" and "The Messianic Era," while in the other set Christianity is pictured by "The Judgment," "Hell," and "The Passing of Souls into Heaven." Only three large panels on the east wall remain to be filled to complete Mr. Sargent's entire scheme, which was begun in 1895 with the "Judaic Development" and continued with "The Dogma of the Redemption" in 1903.

Necrology.—One of the great figures in American art passed away when William Merritt Chase died in his home in New York City on Oct. 23, after an illness of several months. Chase was best known through his work as a painter of portraits and still life, although his landscapes are among the best ever painted in this country. His influence was greatest as a teacher and as a friend and encourager of young artists. Henry Wolf, wood-engraver, died on March 18 in his 64th year. With the coming of process engraving he turned his attention to a more precious form of his art and began a series of engravings on the block after famous portraits and paintings that are treasured by all collectors of such things. Howard Gardner Cushing, best known as a portrait painter, died on April 26 at the age of 47. In addition to his portraits he also did a series of murals for the studio of Mrs. Harry Payne Whitney at Roslyn, L. I. Edith Woodman Burroughs, the sculptor, wife of Bryson Burroughs, curator of paintings in the Metropolitan Museum of Art, died in Flushing, N. Y., on Jan. 6 in her 45th year. She was

best known for her figures of children and for her portrait busts, among which was one of John La Farge. Henry Ward Ranger, the American landscape painter, died on Nov. 7 in New York, aged 58. By his will he provided that the income from the principal of his estate, amounting to $213,320, shall be spent by the council of the National Academy of Design in buying paintings by North American artists, two-thirds of the paintings bought to be the work of men who are 45 years of age or older. All the paintings thus bought are to be distributed among North American art institutes and public galleries; but within a five-year period, beginning ten years after Mr. Ranger's death, the National Gallery at Washington shall have the right to claim any of the paintings thus bought and distributed. Charles Noel Flagg, portrait painter, died in Hartford, Conn., on Nov. 10, aged 68. In 1888 he founded the Connecticut League of Art Students, now the Flagg Night School of Drawing for Men. John J. Enneking, landscape painter, died in Boston on Nov. 17, aged 76. William Gedney Bunce, best known for his Venetian scenes, died in Hartford, Conn., on Nov. 15, in his 77th year as the result of an automobile accident.

ARCHITECTURE

F. Huntington Bosworth, Jr.

Canons of Criticism.—Notwithstanding the classic statement as to the futility of discussing matters of taste, a large part of the critical writing about architecture attempts to point to some present-day tendency by citing or analyzing the taste displayed in the architectural compositions themselves instead of analyzing them from the point of view of how well or how ill they fulfill the object for which they were intended. The latter is the standard by which time tests any work of art, the standard by which the Temple of Amon at Karnak, no less than the Cathedral at Chartres, is declared a great work of art. Both are temples to house the religious beliefs of a people, and so well do they fulfill that object that in each may still be read the minds of that people, the mysticism of their religion and the power of their church. In each case the architect, whether consciously or unconsciously, has analyzed not only the physical needs of the people and their church ceremonials but their spiritual hopes and their religious aspirations, and having analyzed them has built them into the fabric of the structure. Each is characteristic of its time, the Temple of Amon not because the taste was inspired by the art of the old empire but in spite of that fact, and because the physical and religious needs and aspirations of the 19th Dynasty were characteristic of that period of expansion and world dominion.

So to-day the question as to whether or not an American style has, or ever will be, developed is a question of whether the social life of America is characteristic of this country; whether the life of the people, their mode of thought, their social needs and ambitions, are of their own forging or a tatterdemalion garment of borrowed patches. The measure of the greatness of the architecture of this or any period is determined by the subtlety of the analysis of these elements and the incorporation of the results of this analysis into the architecture of the time. It is not for the present day to say that the mode of life in America has a character distinctly its own, or that the people of America are succeeding in working out their social problems along original lines.

Building Zones in New York.—It is interesting to note, however, that the architectural profession as a body is taking its part in attempting to find a solution for those social problems which by its training it is best fitted to study, as in the redrafting of the new building code for New York City, the last sections of which were finally completed and enacted in the early part of the year. The so-called new zoning law of New York is one of the most important pieces of legislation in its relation to the development of the city that has as yet been passed. This law, which went into effect in September, establishes throughout the

city districts for the various types of occupancy, prescribing in each case quite drastic regulations as to the heights of buildings. The full effect of the law will not be apparent for some years but it can not fail to produce a very marked change in the architectural appearance of a city in which real-estate development heretofore has been subject to few restrictive regulations. (See also VII, *City Planning.*)

The Architectural Profession. — Among what might be termed the collective activities of the architectural profession not the least important has been the foundation and publication of a magazine under the auspices and control of the American Institute of Architects. The *Journal of the American Institute*, now in its fourth year, has passed beyond the experimental stage and is a self-sustaining monthly publication dedicated to the advancement of the interests of the profession, a rather tritely self-complacent characterization unless understood along the broadest lines. Its policy and general attitude may be explained best by citing the very able and exhaustive series of articles published in 1916 concerning the public building policy of the Government, in which the almost criminal wastefulness of the present system by which provision is made for the housing of the various governmental activities throughout the country is made apparent; and also, on the other side, its coöperation with the various government departments in aiding in the dissemination of the results of the various tests, experiments and investigations carried on by these departments on building materials and methods.

The educational work carried on by the Society of Beaux-Arts Architects, mentioned in previous issues of the YEAR BOOK, is another activity of far-reaching influence and one showing a steady increase. This work, in fact, has grown to such an extent and its scope has been so enlarged that it has been found advisable to form a new organization known as the Beaux-Arts Institute of Design, incorporated under the control of the Board of Regents of the University of the State of New York. Better to carry on this educational work, the old Society gave up this privilege and turned over to the new organization its building and funds. The Institute has taken over not only the work in architectural education but also the work heretofore done in collaboration with the Sculpture Society and the National Society of Mural Painters.

Notable Buildings of the Year.— There has been completed recently in Oakland, Cal., a series of public schools which are the interesting product of investigating work by the architect, John J. Donovan, and a commission appointed by the school authorities to study the subject of school architecture, especially as applicable to the particular problem in hand. For many of these buildings Mr. Donovan appointed as associates outside architects, among them Lewis P. Hobart, W. J. Miller, Henry Hornbostel, John Galen Howard and L. C. Mullgardt. If for no other reason this series of schools is noteworthy as being the architectural expression of the results of the analysis of their school needs as determined by this commission. The school work in other parts of California by Allison & Allison should be noted also as another interesting architectural expression of the educational needs of that state.

The Y. M. C. A. College in Chicago by Emery Stanford Hall is perhaps as noteworthy a departure from the conventional conception of such a building as has been produced for some time, and one which should be placed in the same category as the California school houses as clearly showing evidence of a sincere endeavor on the part of its author to incorporate into brick and mortar a truthful interpretation of rather peculiar requirements and conditions. In very striking contrast in treatment to this is the group of buildings for the Massachusetts Institute of Technology by W. W. Bosworth just reaching completion in Cambridge on the banks of the Charles River, whose more formal and academic treatment has been commented upon in former reviews (*A. Y. B.*, 1914, p. 734). The New York Orthopedic Hospital and Dispensary by York & Sawyer is another example of a very decided departure from the conventional dispo-

sition of such buildings, and while the style in which it is treated is more closely related to historical precedent than in the case of the Y. M. C. A. College in Chicago, nevertheless it shows the same freedom and breadth of treatment justified and motived by the unaccustomed distribution of its elements.

Warren & Wetmore, the architects of the Ritz-Carlton, the Biltmore and many other hotels, have had perhaps more influence in this country on the conception of what a modern hotel should be than any other architects, and a comparison of their plans for the Hotel Pantlind in Grand Rapids, Mich., with one of their larger New York hotels will furnish as instructive an example as one could find of the modification and adaptation of the typical hotel plan due to a necessity of meeting the peculiar requirements and conditions imposed by a locality, as well as the retention of similar elements where the uses and needs are identical. The Temple of the Scottish Rite in Washington by John Russell Pope should be mentioned as one of the notable additions to the already long list of monumental buildings in the Capitol.

The Cleveland Museum of Fine Arts by Hubbell & Benes, the Robert Dawson Evans Galleries for Paintings of the Boston Museum of Fine Arts by Guy Lowell, and the Hartford Municipal Building by Davis & Brooks, are all compositions worthy of study. The number of private residences which show very distinctive character is large, among which are the Rogers house on Long Island by Walker & Gillette, the Mills house on Long Island by John Russell Pope, the Blair house in New York by Thomas Hastings, the house of Henry Forbes Bigelow in Boston designed by himself, as well as several homes by Elmer Grey and by Myron Hunt in California which should not be passed over. In mentioning residences the new Astor Court Apartments in New York by Charles A. Platt are not to be forgotten as exemplifying in a very decided manner the conception of an apartment house as a collection of homes rather than as a modified hotel. The First Congregational Church of Montclair by Bertram Goodhue, St. Anne's Chapel, Arlington Heights, Mass., by Cram & Ferguson, and the Eddy Memorial by Tracy & Sawrtwout, are all architectural compositions which display a vigor of purpose and an artist's skill.

No list of the buildings completed during the year nor mention of the various architectural activities during that period could hope to be sufficiently comprehensive to include all buildings or all activities which in their sum total go to make up what a future generation with the corrective perspective of time will see to be the real accomplishments of the year. The best that can be hoped is that a list can be compiled of some few of those architectural accomplishments, both physical and social, in which may be read what time has taught us to read in the monuments of other days—a story of the social and economic life of a people. Any tabulation of this character of necessity omits mention of many buildings whose very size would seem to demand their inclusion and the listings of others, such as the St. Anne's Chapel, whose diminutive proportions and almost crudity of treatment would at first thought exclude it from consideration as being a factor of sufficient weight to be appreciable. The heaping of Ossa upon Pelion to form a modern office building, however, does not necessarily constitute an architectural achievement, while a diminutive building which breathes the spirit of religion, crude in material though it be, will ever stand out, a work of art.

LANDSCAPE ARCHITECTURE

JOHN NOLEN

Organizations.—A highly specialized four-year professional course in landscape architecture, under charge of Philip H. Elwood, Jr., as resident professor, was established in 1916 at the Ohio State University to meet the demand for better trained men in the Middle West. The University of Nebraska at Lincoln offered a new course in landscape architecture. A new

traveling fellowship at Harvard was endowed by Nelson Robinson, Jr., of New York, to be known as the Charles Eliot Traveling Fellowship in Landscape Architecture. Benjamin Yoe Morrison was appointed to a Sheldon traveling fellowship in landscape architecture from Harvard to visit Japan and China for special study of pleasure gardens. A meeting of the American Society of Landscape Architects was held in Akron, Ohio, in June in connection with the National Conference on City Planning at Cleveland. (See also VII, *City Planning.*)

National Work.—Robert B. Marshall, for 25 years chief geographer of the U. S. Geological Survey, was transferred to the new position of general superintendent of national parks. An act to establish a National Park Service was passed, providing a separate service with a director under the Secretary of the Interior, to supervise, manage and control the national parks and monuments. A new national park, the Lassen Volcanic National Park, 80,000 acres in extent, was created, embracing generally the area occupied by Lassen Peak and marked also by several other features of interest. Congress also passed an act creating a large national park in the territory of Hawaii. The American Civic Association, in conjunction with the Bureau of University Travel, arranged for a tour of the national parks during the summer months. The Federal Aid Road Act appropriated the sum of $1,000,000 for construction of roads and trails within the national forests. (See also X, *Public Lands.*)

Public Work.—Among the important public works completed or in progress during 1916, were the following: Capitol Park of Iowa, 77 acres; Hudson River Park, New Jersey and New York, to run from Fort Lee Ferry to Bear Mountain and west to the Ramapo Mountains; outer park belt in Cook County, Ill., outside of Chicago; Bloody Run Parkway, Cincinnati; improvement plan for three-unit playground at Bottineau Field, Minneapolis; Weston Field, new play field at Scranton, Pa., 7½ acres, planned by Ernst Hermann, comprising field house, bowling green, tennis courts, shelter house, children's playhouse, and apparatus, diamonds, etc.; field house for McKinley Park, Chicago; active developments of streets, parks and factory sites at Kingsport, Tenn.; Walpole, Mass., Town Forest, 150 acres, dedicated in May; new town for Mt. Union Refractories Co. laid out at Kistler, Pa., near Mt. Union; rural roadside planting by the Massachusetts Highway Commission; highway planting by women's and civic clubs of Calhoun County, Ala.; oil-field town of Pemeta, Okla., parked and boulevarded before it had a citizen; Morgan Park, industrial town at Duluth, Minn.; St. Joseph Manor, Elkhart, Ind.; and park improvements at Utica, N. Y. (See also VII, *City Planning.*)

Private Work.—Definite progress was made in domestic landscape architecture and in the design and development of private places. Each year the services of the landscape architect are being employed more widely to contribute to the convenience and beauty of homes that are moderate in cost as well as great estates. Among the more important private places of the year may be mentioned those of F. A. Seiberling, Akron, Ohio; John E. Liggett, Sands Point, L. I.; Mrs. F. S. Coolidge, Pittsfield, Mass.; Cyrus H. McCormick, Lake Forest, Ill.; John J. Raskob, "Archmere," Claymont, Del.; William Hall Walker, "Brookside," Great Barrington, Mass.; and Luke Vincent Lockwood, Riverside, Conn.; Henry Sanderson, Oyster Bay, N. Y.; Herbert L. Clark, Radnor, Pa.; Lewis H. Lapham, New Canaan, Conn.; H. H. Rogers, Southampton, N. Y.

Competitions and Exhibitions.—Two important exhibitions of the year were those of the Boston Society of Landscape Architects, the Harvard University students, and students at the Massachusetts Agricultural College, at the Boston City Club during January; and the Joint Exhibition of Architecture, Landscape Architecture, and Allied Arts, in Boston during November. A collaborative competition by an architect, a landscape architect and a sculptor was held in connection with the latter. Another competition of interest was that of the National Americanization Committee for housing immigrants.

Bibliography.—The principal publications of the year were:

Architecture and Landscape Gardening of the Exposition. (Paul Elder & Co.)
BAILEY, Liberty H., ed.—*Standard Cyclopedia of Horticulture,* vol. IV. (Macmillan Co.)
BIRD, Charles S.—*Town Planning for Small Communities.* (Appletons.)
COX, Laurie Davidson.—"A Street Tree System for New York City, Borough of Manhattan." (New York State College of Forestry, Syracuse University.)
"Glimpses of Our National Parks." (U. S. Dept. of the Interior.)
HAMBLIN, Stephen F.—*Book of Garden Plans.* (Doubleday, Page & Co.)
KELLAWAY, H. J.—*How to Lay Out Suburban Home Grounds.* 2d ed. (John Wiley & Sons.)
KING, Mrs. Francis.—*The Well Considered Garden.* (Chas. Scribner's Sons.)
LEWIS, Nelson P.—*The Planning of the Modern City.* (John Wiley & Sons.)
LOWELL, Guy.—*Smaller Italian Villas and Farmhouses.* (New York, Architectural Book Pub. Co.)
LYLE, William Thomas.—*Parks and Park Engineering.* (New York, John Wiley & Sons.)
MCFARLAND, J. Horace.—*My Growing Garden.* (Macmillan Co.)
MILLER, Wilhelm.—"The Prairie Spirit in Landscape Gardening." (Illinois Agricultural Experiment Station, Urbana, Ill.)
NOLEN, John, ed.—*City Planning.* (D. Appleton & Co.)
———. "Better City Planning for Bridgeport." Final Report to the City Plan Commission.
———. "More Houses for Bridgeport." Report to the Chamber of Commerce.
ROBINSON, Charles Mulford.—*City Planning, with Special Reference to the Planning of Streets and Lots.* 2d ed. (G. P. Putnam's Sons).
SHELTON, Louise.—*Beautiful Gardens in America.* (Chas. Scribner's Sons.)

ARCHÆOLOGY

CLASSICAL ARCHÆOLOGY

WILLIAM NICKERSON BATES

Greece.—The continuation of the great war has seriously interfered with archæological studies and has largely prevented excavations on classical sites during the year. Some work, however, has been done in Greece.

The Erechtheum.—The American School of Classical Studies at Athens is making progress with its great work on the Erechtheum, and a certain amount of digging about the building from time to time has brought to light interesting details. Thus Mr. Hill has discovered that the northern retaining wall of the Old Athena Temple was smoothed off east of the crypt where the Cecropium is supposed to have been located. This implies that this part of it was exposed to view, while the western end, which was left rough, must have been covered. In one of the walls within the Erechtheum a piece of an archaic Greek inscription has been found.

Corinth.—Under Mr. Blegen's direction the School has done some excavating on one of the Mycenæan sites discovered at Corinth, and brought to light objects which are said to belong to the Middle Minoan period. No report on these excavations has yet been made.

Tiryns.—The Greeks have done some archæological work, but their most important discovery was made by chance. A workman of the agricultural school founded by Capo d'Istria at Tiryns, while digging about 100 yards from the acropolis, unearthed a treasure which had been hidden in Mycenæan times. It had been placed in a chest and buried. It consisted of swords, utensils, a beautiful tripod, bowls, and a large bronze vase filled with jewelry. This was of gold, agate, ivory, amber, and glass paste. There were bracelets, collars of gold, two gold diadems decorated with pieces of amber in the shape of crosses, and a large number of rings. On the bezel of one ring a priestess in Mycenæan dress appears seated before a columned altar, while from the other side four figures in the guise of fantastic animals approach in solemn procession. Above are the sun, moon and stars. This is evidently a religious scene.

Athens.—In Athens the Greeks have continued their excavations southeast of the Acropolis in an effort to find the site of the Odeum of Pericles. Some seats have been unearthed which may have belonged to the building, and a wall discovered which may have separated it from the precinct of the theatre. Cuttings in the rock indicate that the Odeum as rebuilt by Ariobazanes, King of Cappadocia, was probably square in plan and arranged like the Bouleuterion at Priene. Among the objects found were several

pieces of sculpture of no great importance, stones from the Parthenon cast down by the explosion of 1687, and a bone disk which had served as a ticket of admission to the revival of a play by Aeschylus in Roman imperial times. On one side is a picture of a building with high central portion which may represent the Odeum.

The Greeks have also done some work at the Ceramicus, and report upon various discoveries, chiefly topographical, made by archæologists serving in the Greek army in Thessaly and Macedonia.

Italy.—In Italy there have been some interesting acquisitions by the museums, and some excavating has been done.

Rome. — When the foundations were being dug for the new building of the American Academy in Rome considerable portions of the aqueduct of Trajan, which supplied the city with water from beyond the Lake of Bracciano, were found. Part of the channel has been so preserved that it may be visited from the basement of the new building. The Italians have been continuing their work among the ruins of the palaces on the Palatine in Rome.

Caere.—Near Caere they have found some very early Etruscan tombs. They consist of a ring of stones surrounding a conical mound. Within is a rectangular grave covered with stones.

Calabria.—In Calabria some excavating has been done. Thus at Caulonia some fine architectural terra cottas which had belonged to a small temple came to light; at Reggio parts of the old Greek town walls were uncovered; and at Cotrone many marbles, including some with long inscriptions, were found.

Museums.—The Boston Museum of Fine Arts has made several important additions to its collections, the most interesting of which is a marble head of Demeter, larger than life size, dating from the fourth century B. C. It is an original work of a Greek sculptor strongly influenced by Praxiteles. The head was made separately and was fitted into the body. It probably belonged to a cult statue. Another important acquisition is a marble head of a goddess, perhaps Persephone, greater than life size. It is a copy, made in Roman times, of a bronze original dating between 460 and 450 B. C. This, too, was made to be fitted into a body.

The Metropolitan Museum of New York has also acquired several interesting marbles, including the head of an athlete which is Greek work of fourth century date and shows strong affiliations with Praxiteles; the head of a young girl of late Greek date, which likewise shows Praxitelean influence; and an excellent Roman portrait head of the latter part of the first century A. D.

T. L. Shear has published in the *American Journal of Archæology* a fine head of Helios from Rhodes, which dates from the fourth century B. C. and shows the influence of Lysippus; and E. H. Swift an interesting female head from Corinth, dating from the time of the Antonines. A. W. Van Buren, librarian of the American Academy in Rome, has brought out a *Bibliographical Guide of Latium and Southern Etruria.*

EPIGRAPHY

WALTER DENNISON

In the *Transactions of the American Philological Association* (xlvi, 229) George Hempl presents an interpretation of the archaic inscriptions on three "clay balls" and one gold ring discovered in Cyprus, and seeks to show the relationship which the characters of the inscriptions bear to the Early Minoan and the later Cyprian. One of the objects of this research and of similar ones is to learn the origin and early history of the Greek alphabet from which our own is derived. In *Classical Weekly* (ix, 98 *et seq.*) is a series of short articles on some archæological collections in the United States, from which it appears that there is a small collection of Greek and Roman inscriptions at Columbia University and another small collection at Johns Hopkins University.

Greek Inscriptions.—Six Greek inscriptions from Halae in Locris, dating from the sixth to the third century B. C., are edited by Hetty Goldman in the *American Journal of Archæology* (xix, 438); one records the

dedication of a statue to Athena and another contains a list of officials. Matters of linguistic interest in these inscriptions are discussed by Carl D. Buck in *Classical Philology* (xi, 211). Some quotations from Greek literature which occur in recently published inscriptions are collected by K. K. Smith in *Classical Weekly* (ix, 41). The quotations are from the *Iliad* and *Odyssey*, from Euripides, Lucian and others. In Division III, Sec. A, Pt. 5, of the *Publications of the Princeton University Archæological Expedition to Syria in 1904-1905 and 1909*, E. Littmann, D. Magie and D. R. Stuart publish 178 inscriptions, all of which are Greek with the exception of two, which are Latin.

Latin Inscriptions. — In *Classical Weekly* (ix, 114) Ella Bourne translates and comments upon a long, metrical Latin inscription of 52 lines, which was found in 1912 in Rome. The inscription is sepulchral and was written to mark the last resting place of Allia Potestas, a freedwoman of Allius. The contents of the inscription, which dates from the end of the third century A. D., are particularly interesting. At the annual meeting of the Archæological Institute of America, held at Princeton in December, 1915, J. A. Montgomery described and commented upon a new Roman inscription, discovered by him near Abeih, in southern Lebanon, which throws light upon the tomb builders in Lebanon (*Am. Jour. of Archæol.*, xx, 75). At the same meeting Lindley R. Dean read a paper on "Some Latin Inscriptions from Corinth." In the *American Journal of Archæology* (xx, 173) J. C. Rolfe refers again (*A. Y. B.*, 1915, p. 738) to the inscriptions in the University of Pennsylvania collection and comments upon one inscription in particular. In a book entitled *Roman Cursive Writing* (Princeton Univ. Press, 1915) H. B. Van Hoesen draws largely upon Pompeian *graffiti* and wax tablets for evidence in tracing the development of the Roman cursive alphabet.

MUSIC

Frederick H. Martens

General Survey of the Year.—The third year of the European War still bears witness to the survival of strenuous musical endeavor in the countries engaged in the contest: concerts are given, operas are produced; trench-operettas and musical *vaudevilles* reflect its persistence on the very scene of conflict. Yet the conscription of nations *en masse* and the shifting of the European financial and economic balance to this country have not been without effect. The decreased creative energy in music in Europe has stimulated the creative output in America; recitals and concerts have been more frequent, and a general impetus has been given to American composition. Despite increasing cost of paper many books on music have been published, and none of the important musical magazines has withdrawn from the field. In an educational sense the war has done much to break traditions of musical dependence on Europe which had been already rudely shaken before it began. Increased attention given to public-school music and community music and to the subject of "musical appreciation" in college curricula, a richer development of concert and recital activity, and the growth of interest in the ballet as a semi-musical dramatic art form have been features of the year.

Opera.—The year 1916 lacks a distinctively "American" opera. The actual novelties presented at the Metropolitan include: *Goyescas* (Jan. 15), by the ill-fated Spanish composer Granados, a victim of the *Sussex* disaster, a short score without much dramatic interest, but rich in racial color, dealing with social and sentimental aspects of Madrid in Goya's day in music of much originality and atmospheric charm; *Les Pêcheurs de Perles* (Nov. 13), by Bizet, an earlier and smoothly Gounodian score by the composer of *Carmen;* Gluck's *Iphigenia in Tauris* (Nov. 25), in which the Richard Strauss revision was not sufficient to relieve the sternly tragic character of story and music and (to modern ears) the excess of dramatic *recitative.* The most genuinely interesting work perhaps was Riccardo

Zandonai's *Francesco da Rimini* (Dec. 22), a fine operatic development by a modern Italian verist of the subject-matter of a tragedy which has stimulated poets and musicians from Dante's day onward. D'Annunzio wrote the poem which forms its libretto; there is wonderful love and festal music included in the score, and its four acts end in a stirringly dramatic climax. The revivals have not been without interest. On Feb. 5 the practical immortality of Rossini's *Barbiere di Siviglia* was commemorated at the Metropolitan, "one hundred years ago to a day, from its first performance in Rome." Herman Goetz's Shakesperian *Der Widerspänstigen Zähmung* (March 15), pleasing but not particularly characteristic, and Giordano's *Andrea Chénier* (Nov. 16, Lexington Theatre, Max Rabinoff Boston Opera Company), last heard during the Manhattan season of 1907-1908, call for mention. A departure worth noting was the production of two "chamber-music" operas by Mozart, *Bastien et Bastienne* and *The Impresario*, with string orchestra, at the Garrick Theatre, New York, in November. The *rococo* grace of the music pleased, and, as H. F. Peyser says: "There could be no form of artistic entertainment more charmingly calculated to relieve the settled austerity of customary musical functions."

The Ballet.—While the ballet is more a composite musical art form than opera, the stress laid on its music by organizations such as the Diaghilev *Ballet Russe* and the standing of the composers who are adding to its musical repertory demand consideration. During the year it has been the means of introducing to large audiences, not necessarily of music lovers, such striking and important symphonic scores as Stravinsky's *Pétrouchka* and *L'Oiseau de Feu*, Balakirev's *Thamar*, Debussy's *L'Après-midi d'un Faune* and Rimsky-Korsakov's *Sadko* (for which Adolf Bolm created a brilliant choregraphic scheme which is the very expression of its musical programme). Nijinsky's interpretation of *Till Eulenspiegel* also has opened new vistas of appreciation and understanding of Strauss's symphonic poem. The general increase of interest in the modern pantomimic ballet as an art form has reacted favorably on the *ballet d'opéra*, in resuscitating the ballet music of important operatic composers and giving it a hearing. In this connection, the Boston Opera Company (Max Rabinoff) has been especially active in performances of *Faust, Carmen, La Muette di Portici* and other scores, in which the ballet and its music were a feature.

Pageant and Community Music.—The allied form of the pageant has maintained its popularity, that of Yale University (October), showing the development of New England from the Revolution to the present time, with music by Horatio Parker, Seth Bingham, Stanley Smith and William Haesche, being perhaps the most individual. The New York "community masque" *Caliban by the Yellow Sands*, music by Arthur Farwell, scenery by Joseph Urban, in which 2,000 performers showed the development of the drama, in dramatic dance, interlude and song, from Osirian rites to Shakespearean revel, was the most important in an artistic and communal sense. Community music in New York ("Song and Light" Festival, Central Park in September), Chicago, Baltimore, Boston and other cities, open-air opera and civic and school orchestras have won increased appreciation. Subsidized "state" orchestras even are now advocated in various sections of the country.

Symphonic Music.—New symphonic music by American composers presented by the orchestras during the year includes: Charles Martin Loeffler's symphonic poem in one movement, *The Mystic Hour* (June, Norfolk Festival), its programme one of religious meditation, the passing of a pilgrim through changing scenes to the haven of a minister, where compline song greets him with its message of rest and adoration; two orchestral *Sketches* by A. Walter Kramer, a *Chant Nègre*, warm and colorful, with Southern negro inflections, and an impressionistic *Valse triste;* Seth Bingham's *Fantasia;* Daniel Gregory Mason's fine *Prelude to the Pageant of Cape Cod;* Ernest Schelling's *Impressions from an Artist's Life*, a modernistic orchestral development of the idea of tonal charac-

ter studies underlying Schumann's *Carnaval;* and a "fantasy suite," *The Sphynx,* by Samuel Bollinger (St. Louis). The list of European symphonic novelties and revivals is a notable one. Arousing the greatest expectations, which have been only in part realized, was Richard Strauss's new *Alpine Symphony* (first time in America, April 25, Cincinnati Orchestra under Dr. Kunwald). In spite of the composer's habitual technical skill in orchestral effect and brilliant programmatic pages, the work was generally considered dull. Schönberg's *Kammersymphonie,* another ultra-modern work, was more appreciated. One of the events of the year, too, was the production of Mahler's *Eighth Symphony,* under Stokovsky, at the Metropolitan, New York, on April 9, by an orchestra and chorus of 1,000 performers in all. Russian music included a firstling symphony by Igor Stravinsky; Liadov's *Enchanted Lake,* a tone-poem; Rimsky-Korsakov's *Serbian Fantasy;* Glazounov's *Overture on Three Grecian Themes;* and Rachmaninov's *Orchestral Fantasia.* French music was represented in part by Maurice Ravel's *Daphnis et Chloe* suite; Florent Schmitt, *Pupazzi;* and Alfred Bruneau, *L'Attaque du Moulin.* A Swiss composer, Ernest Bloch, has directed his fine symphonic pieces *Printemps-Hiver* in Aeolian Hall, and Percy Grainger, the Australian composer and pianist, has written perhaps the most generally popular orchestral work of the year in his four-movement symphonic suite *In a Nutshell,* full of humor, color and dramatic effect. An interesting feature of this suite is the introduction, in the score, of Deagan percussion instruments (steel marimba, wooden marimbaphone, Swiss staff bells and nabimba), new and "marvellously perfected examples of American inventive ingenuity in the field of musical instrument-making."

Instrumental and Choral Works.—Some important additions have been made by American composers to the literature of instrumental and choral music during the year. Among them are a pianoforte quintet in A minor by Henry Hadley; David Stanley Smith's quartet in A, a new sonata for violin and orchestra by Frederick A. Stock, and a new *Thunderbird* (N. A. Indian) suite by Charles Wakefield Cadman. The Flonzaley Quartet has introduced important foreign novelties: three fascinating sketches by Igor Stravinsky, for strings; a quartet by Serge Tanëiev, and one by the Swiss composer Ernest Bloch, an important work, in part exotic (Tahitan) in color. The Kneisels have introduced among others a quartet by Reger. New choral works have included Deems Taylor's cantata *The Chambered Nautilus,* Sigismund Stojowski's *A Prayer for Poland,* which "expresses the aspirations of the Poles of today in music of dignity and power," Rachmaninov's *Voices of Spring,* Percy Grainger's stirring *Marching Song of Democracy,* and William Lester's choral ballad *The Christmas Rose.* Instrumental and choral concerts have multiplied, and beside American artists of established reputation and those entering the recital field, many European singers and instrumentalists have been active in it during the year. The increase in the number of concerts of various kinds given in a city like New York, sometimes as many as 25 a day, has made the task of the music critic a difficult one.

Music in Europe.—As already mentioned, music in Europe is struggling valiantly against adverse conditions. Many concerts and recitals are more or less patriotic in character, devoted to hospital and alleviation funds. The tendency toward nationalism in music has been furthered in the individual countries by the increasing bitterness of the struggle, and the future of music in Europe after the war is a favorite subject for speculation in the periodicals of every nation. In Russia (Moscow, Petrograd) new symphonic works (*Third Symphony,* Miaskovsky; *Fairy Tales,* Tscherepnine; *At the Rock of Starabags,* Kalynia), new operas (A. Tanëiev's *Snow Storm,* Veniasky's *Migae,* Olenin's *Kudeyar*), and revivals of older Tschaikovsky, Rimsky-Korsakov and Dargomijsky scores have been largely given. In France and England there has been considerable concert activity, but few operatic novelties, though the Paris *Opéra Com-*

ique has announced two new scores, Vincent d'Indy's *Saint Christophe* and Alberic Magnard's *Guecourt*. In Italy, Carlo Zangarini's *Maria sul Monte*, a new opera, has been produced in Milan. In Germany too new grand operas have been scarce, though Richard Strauss is completing his *Women without a Shadow*. Max Reger, however, shortly before his death in May, completed a choral *Requiem* which has been proclaimed "the most important composition that the war has thus far produced"; and Jan Sibelius, the great Finnish composer, has also recently completed a new symphony.

Literature.—Among the books of the year are: *A History of Music*, by Sir C. V. Stanford and Cecil Forsyth; *The Larger Forms of Musical Composition*, by Percy Goetschius, "with copious quotations from ultra-modern and even 'futurist' composers"; vol. ii of Daniel Gregory Mason's excellent *Appreciation of Music*, devoted to *Great Modern Composers; The Science of Musical Sounds*, by Dayton Clarence Miller, dealing comprehensively with sound analysis; and *A New System of Harmony*, by Eduardo Gariel (National Conservatory of Music, Mexico City), based on "four fundamental chords" and dedicated to Venustiano Carranza. Of a more special interest are: Louis C. Elson's *History of American Music* (New Edition); *The Story of the Symphony*, by Markham Lee; *History of the Violoncello*, by E. V. D. van der Straaten; *The Art of Accompanying*, by Algernon H. Lindo, a *vade mecum* of specific interest; *English Folk-Song and Dance*, by Frank Kidson and Mary Neal; *The National Music of Poland*, "its character and sources," by Marguerite Walan; Arnold Dolmetsch's valuable *Interpretation of the Music of the XVII and XVIII Centuries*, in the light of contemporary evidence; and *Sources of Keyboard Music in England*, by Charles Van Den Borren. Biographies include: Markham Lee's *Brahms*, Romain Rolland's *Handel* (translated by Dr. Eaglefield Hull), H. O. Anderton's *Granville Bantock*, W. C. Berwick Sayers' *Samuel Coleridge Taylor, Musician*, and Romain Rolland's *Some Musicians of Former Days*. To the literature of the musical essay Carl van Vechten contributes his entertaining *Music and Bad Manners*. And Margaret Armstrong's *Wild Birds and Their Music*, with many musical diagrams, is supplemented by Henry Olds's *Twenty-Five Bird Songs for Children*, "with harmonizations developed out of the bird song itself." A clever study of the opera libretto ("The Book of the Opera") is contained in Brander Matthews' *A Book About the Theatre*.

Necrology.—The year's mortuary list includes some notable names. The deaths of John Walter Hall, organist and vocal teacher; Herman Perlet, comic opera conductor and composer (January); Ludwig M. Ruben, well-known musical manager; Dr. William H. Dana, composer, author of works on theory and orchestration; and Louis Blumenberg, 'cellist and director of the *Musical Courier* (February), preceded those of John F. Runciman, music critic of the *Saturday Review* (London), author of *Richard Wagner, Composer of Operas;* of Tom Karl, noted operatic singer (March 19); Joseph Gotsch, 'cellist, composer, teacher (April 21); Edward J. De Coppet (April 30), founder of the Flonzaley Quartet; and Max Reger (May 12, Leipzig), one of the foremost of modern German composers, "most facile contrapuntist since Bach." On June 10 died Max Vogrich, piano virtuoso, editor, composer (operas: *Vanda, Buddha, King Arthur*, much music for piano, violin, etc.). Early in the following month Rodolphe Berger, called *le roi de la valse* in Paris, committed suicide in Barcelona; Robert Grau, musical and theatrical impresario (Aug. 9), and Max Heinrich (Aug. 16), composer and *lieder* singer, died in New York. The German conductor Fritz Steinbach (Munich); Karl Klindworth (Berlin), celebrated piano pedagogue and editor (piano scores of Wagner dramas, Chopin works); Ivan Knorr (Frankfort-on-Main), distinguished theorist, composer and author; and Hamish McCunn (London), the Scotch composer, also died in the course of August. In September Friedrich Gernsheim (Berlin), called "the Dutch Brahms" in Holland, a distinguished German creative musician, passed away; in October died

Silas Gamaliel Pratt, American concert pianist and composer; in November Pauline von Erdmannsdorfer-Fichtner, German concert pianist; and in December Sir Francesco Paolo Tosti, Italian vocal teacher and composer of songs; and Hans Richter, for more than 40 years the most celebrated Wagner conductor in Europe, and long identified with the Bayreuth festivals. On the 21st of the same month Dr. William Wallace Gilchrist, an American composer and organist of high standing, who had made notable contributions to American music in the choral fields ("46th Psalm," "Christmas Oratorio"), passed away at Easton, Pa.

THE DRAMA

WALTER PRICHARD EATON

The Theatrical Year.—As in the YEAR BOOK for 1915 (p. 742), we base our figures for the year on the period from December to December. We find that from Dec. 1, 1915, to and including Nov. 30, 1916, 117 plays and musical comedies or burlesques have been produced in those New York theatres which are frequented by the critics and so are subject to record, while in addition there have been eight different entertainments composed of one-act plays comprising a total of 27 dramas in the short form. As the majority of plays produced in America either eventually get to New York if they are successful, or else are produced in New York preparatory to a tour through the country, this record will be found upon examination to represent fairly the theatrical activities of the nation.

The total of 125 evening entertainments shows a decrease over the preceding year, when the total was 153. The difference can be accounted for in part by the fact that no new theatres have been opened, while one or two of the older theatres have housed motion pictures during the autumn; but still more by the fact that a greater number of plays have proved popular in 1916, necessitating fewer changes. Financially considered, the year has proved a good one for the theatres, both in New York and through much of the country.

The long plays of 1916 are divided as follows, according to authorship and content: 53 are by native authors, for the most part with scenes and characters drawn at least roughly from American life; 20 are of foreign authorship; 10 are revivals; six are Shakespearian productions (representing but five plays, as both Beerbohm Tree and Mr. Hackett produced "The Merry Wives of Windsor"); and 28 are musical comedies or musical burlesques and spectacles. In 1915 62 plays were of American origin, but, on the other hand, there were the same number of foreign plays, 20. Hence, while in 1916 the foreign plays formed a larger percentage of the new dramas (37 per cent.), this seems merely to have been due to the fact that the native plays were more successful and fewer had to be produced to keep the theatres full. There were fewer revivals than in 1915, and four fewer musical productions. Three different managers produced Shakespeare, owing, of course, to the tercentenary celebration in the spring. The one-act plays, 27 in number, one less than in 1915, were produced by the Washington Square Players, by the Neighborhood Playhouse on the East Side, a theatre maintained by private charity at popular prices, or by Stuart Walker in his Portmanteau Theatre. Twelve of these one-act pieces were of native origin, and 15 were by foreigners.

It is plain from these figures that the musical comedy so-called has nothing like a monopoly of our stage and that the healthy percentage of native work is being maintained. While it is highly undesirable that we should not see in our theatre the best foreign plays, our theatre can have no genuine vitality until it is capable of producing its own entertainment in bulk. This it is now doing, without question, in every department save the musical comedy. Nearly all our musical pieces of any musical worth are still adapted either from German or Austrian sources.

Classification of Plays.—A classification of American plays according to the conventional types is becoming

more and more difficult. This is due in part to cheap and hasty work on the part of the writers, in part to the fact that the old lines are naturally breaking down. The most common development of American plays just now seems to be toward a mixed type which gravitates between farce and melodrama. G. M. Cohan's "Seven Keys to Baldpate," produced several seasons ago, was an early example of this form of play, and it still remains the cleverest. It hit a popular chord and such a play as "Cheating Cheaters" in 1916 is a result. Farce and sentiment also are mixed in the native type our more popular playwrights are evolving. The result of this mixture too often is that the sentiment does not ring true. True sentiment is difficult without serious character portrayal; it becomes mere mawkishness; but the more naïve theatre-goers seem to relish it. A case in point is "Turn to the Right," produced in the autumn, by Winchell Smith and John E. Hazzard. Of the 53 American plays of the year, 13 may be classed without any quarrel as farce; in fact they are so classed on the programmes by the authors themselves. The so-called comedies number 19, though a careful critic would be forced to list many of them as farces. This makes a total of 32 comic plays, as against 21 plays which in part or wholly can come under the classification of drama. Of these 21, some, like Booth Tarkington's "Mister Antonio," played by Otis Skinner, are but comedies touched with a hint of more serious purpose. Others, like Bayard Veiller's "The Thirteenth Chair," are out-and-out melodramas. The proportion of seriously emotional plays, with the emphasis on character drawing or on a problem of conduct, is actually very small. It may truthfully be said that 1916 has been a year of light, even frivolous, native drama. How far this is due to the European War, to the pressure of grim reality on our daily consciousness so that we seek the theatre as a relief, perhaps time alone can tell. It is significant that for some years after our own Civil War our stage was given over almost entirely to frivolity. War is not a patron of the arts of the theatre.

Best Plays of the Year.—The best plays of the year, aside, of course, from the revivals, have been chiefly of foreign authorship. It is significant that G. B. Shaw remains in 1916, as he has been for almost a decade, one of the most popular of English-speaking playwrights in this country and the author whose work is awaited with the most anticipation. In 1916 he was represented on the stage in New York by four plays, "Captain Brassbound's Conversion," revived by Miss Grace George; "Major Barbara," produced by the same actress; "Getting Married," produced by William Faversham in the autumn, and "The Great Catherine," a one-act skit, played by Gertrude Kingston at the Neighborhood Playhouse. The smooth, intelligent, polished ensemble acting of "Getting Married," together with the quality of the drama, made the production notable. Miss Kingston's performance as *Catherine* was also one of the acting achievements of the season.

Perhaps the most notable production of the year, however, was that of Galsworthy's tragedy "Justice," a play written several years ago but never acted professionally in America until the spring of 1916. It marks high water in the thesis play in English, and is a drama of strangely moving character and burning sincerity. The performance was admirable in every respect and the grim play was unexpectedly successful, although seven theatres in New York refused to house it, their managers predicting failure.

Another notable production, made by Winthrop Ames, was "Pierrot the Prodigal," which is *"L'Enfant Prodigue,"* a famous French pantomime first acted in New York at Augustin Daly's Theatre a quarter of a century ago and at that time a failure. Mr. Ames supplied charming scenery, a skilled cast, an excellent orchestra, and brought it to life again, this time with much popular favor. It exemplifies the delicate art of pantomime at its most charming and eloquent, and gave to the autumn season of 1916 a touch of poetic grace sorely needed.

Among the native plays produced, few can be detected which seem from

this near view of any enduring value, nor did any new playwrights of much promise emerge. On the whole, of the full-length plays, the prize should perhaps be given to "Old Lady 31," a comedy by Rachel Crothers, based on a novel. This play, capitally acted, tells the story of a destitute old couple, of how the husband was taken with the wife into an old ladies' home where he became No. 31, and of the many adventures which befell him there. It is a play of quaint humor and much sentiment, and discloses no little truthful observation and knowledge of human nature. It is work of genuine human values.

The one-act plays of native authorship produced by the Washington Square Players, who in the spring of 1916 moved into the Comedy Theatre on Broadway, thus entering into more direct competition with the established playhouses, were on the whole of considerably more interest than their longer commercial rivals. "The Clod," by Lewis Beach, a melodramatic tragedy of our Civil War but with a real spiritual significance, and "Trifles," a tale of the effect on a woman of lonely farm life, written by Susan Glaspell, were two Washington Square dramas which stood out above the general level of the year. They were effective in the theatre, and when read they would bear enduring and thoughtful scrutiny. In short, they were pieces of genuine dramatic literature.

Indeed, the productions of the Washington Square Players, of Miss Kingston at the Neighborhood Theatre, including Lord Dunsany's "The Queen's Enemies," and of Stuart Walker at his Portmanteau Theatre, including two other plays by Dunsany, were easily among the most interesting features of the year. None of these organizations is confined to one spot. Even the Washington Square Players are sending out a second company on tour. All of them are bringing to many people drama with an imaginative appeal, a range of fancy, beyond that of the ordinary theatre. The works of Lord Dunsany, especially, unique in our language, have made great strides toward popularity during the year, entirely through the efforts of these workers outside the standard playhouses or of various clubs of amateurs. The time apparently has come when we are taking the theatre partially into our own hands, and creating companies which will produce other things than the "best-seller" type of play.

Stage Craft and Acting.—The ice was broken for the advance of the newer type of stage decoration and scenery in 1915 (*A. Y. B.*, 1915, p. 744), and 1916 saw further progress. This progress was most marked in the productions of the Washington Square Players, who began indeed as rebels from the old order. Joseph Urban, formerly of Vienna, a man of little original talent but an excellent copyist of German models, has been busy all the year, making sets not only for such musical pieces as the Ziegfeld "Follies," but for Mr. Hackett's production of "The Merry Wives of Windsor." This latter play was staged by Ordynski, a pupil of Max Reinhardt, with a certain conventionalization of posing and speech which gave the whole production a highly original flavor of style. Bakst, the Russian scenic artist, has made designs for the big Hippodrome. Above all, Robert E. Jones, a native American, has come into his own, and has been kept constantly employed, chiefly by the manager, Arthur Hopkins, making sets not only for a fanciful play, "The Happy Ending," but for a realistic drama and for a farce. This farce, "Good Gracious, Annabelle," he handled with a nice blend of the impressionistic and the conventional old-fashioned scenery, not offending those who must see a set that "looks like the place," and yet creating an attractive design of form and color, in the mood of the drama, and simple, uncluttered with useless furniture, leaving something to the imagination. Add to this the fact that another American is making scenery for the Metropolitan Opera House, and that Maxfield Parrish has prepared the scenery and costumes for a fairy play to be produced early in 1917, and the prospect for the real scenic artist to get a chance in our native theatre looks brighter than ever before. There is no lack in this country of men with the combined architectural and pictorial gifts and the mechanical dex-

terity to create a genuine American school of stage craft. All they need is proper encouragement and proper opportunity for experiment.

Less can be said about the progress in acting during the year. The small experimental theatres have as yet developed no notable talent. The theatre of commerce during the year, at least, seems to have developed none either. Charming young girls come forward each season, but they lack the opportunity to practice, and they do not play *rôles* of sufficient depth to develop their possibly latent powers. John Barrymore, a young actor hitherto identified with romantic comedy, was notably successful in the pathetic *rôle* of the young clerk in Galsworthy's "Justice." Paul Clerget, a Frenchman, was splendid as the father in "Pierrot, the Prodigal." Reginald Barlow as the solitary man in the old ladies' home, in "Old Lady 31," acted with unction and comic zest and a fine feeling for character. John Drew, dropping his former type of part and appearing as *Major Pendennis* in a dramatization of Thackeray's novel by Langdon Mitchell, demonstrated that his long training and great technical skill fit him well for other things than fashion-plate heroes. Ruth Chatterton, a young woman of much personal charm, in A. E. Thomas's pretty romantic comedy "Come Out of the Kitchen," showed growth in expertness, proving that perhaps she will some day become a first-rate artist. Actors like Otis Skinner and George Arliss, who are capable of giving us the thrill of really great acting, were both unfortunate in their selection of plays, as was also Cyril Maude. Mrs. Fiske spent the year in "Erstwhile Susan," her vehicle of the season before. The truth is, the kind of play we are getting today does not invite acting of sweep and passion. There is no sweep and no passion in the plays.

Stock Companies and Motion Pictures.—It was a good year for the stock companies, especially in the Middle West. It would be too much to say that these stock companies, as a rule, represent anything of importance to the art of the theatre, because they are hastily assembled, carelessly conducted, and usually play merely the most obvious and widely popular of Broadway successes, two or three seasons old. Yet they do represent a fairly cheap form of amusement considerably above the motion pictures in intellectual appeal, and consequently their increase in number and their greater receipts indicate an increasing public demand for the spoken drama. Moreover, in some cases, notably at the Municipal Theatre, Northampton, Mass., these stock companies vary the popular fare with better plays, and strive genuinely to serve the community more or less as a library should serve it.

Since the motion pictures are generally referred to by their manufacturers as "film dramas," we may close our review with a brief mention of them. As in the past, New York has been treated to several spectacular "film dramas," occupying legitimate theatres and asking prices sometimes as high as the spoken drama. But none of them has duplicated the success of "The Birth of a Nation," and most of them have been failures at the advanced price. An exception is "A Daughter of the Gods," in which Annette Kellerman and other mermaids are seen swimming in a transparent ocean, the beauty and grace of the spectacle atoning for the silly story. "Intolerance," by the creator of "The Birth of a Nation," proved to be a case of the mountain laboring and bringing forth a mouse. It would appear that after the first flush of novelty has gone, the motion picture, no matter how long and how costly to manufacture, cannot compete on the same terms with the spoken drama. The public regard it as something of less value in dollars and cents, as one of the varieties of cheap amusement. This might not be so true were it not for the fact that the motion pictures have made no appreciable progress artistically. They still tell exactly the same sort of story they have been telling over and over, in just about the same conventionalized way. So far as 1916 has disclosed, the motion picture has made no artistic progress, and not to progress in this world is to go backward. The spoken drama has nothing to fear from the film variety. It will continue to hold an audience sufficient for its needs.

XXX. LITERATURE AND LANGUAGE

AMERICAN LITERATURE

(Nov. 15, 1915, to Nov. 15, 1916)

EDWARD EVERETT HALE

Fiction.—The greatest productivity in creative literature in the United States during 1916 has been, as usual, in works of fiction. The publication of novels and short stories, however, seems to have been somewhat less than that of 1915, which was somewhat greater than the publication of 1914. It is impossible to present exact statistics on this subject; the entire production of fiction in books and periodicals is now so very great that no one makes an attempt to comprehend it. The statistics published in the *Publishers' Weekly*, however, give some idea of the total production of books which may be called fiction. The total number of books (including pamphlets) published in the United States in 1914 was 8,563; in 1915 it was 6,932; the figures for 1916 are not yet available. Of these the books classified as fiction by American authors in 1914 numbered 689; in 1915, 643; for 1916 the figures are not yet complete but an estimate based on the publication of the first six months would give a total of 626. Of these books about one-fourth are usually new editions of books published in other years. Of this considerable amount of fiction, which includes but a very few of the immense number of stories and novels published in the many periodicals, only about a half attract any general attention. Lists or summaries regularly published by the *Dial* and other literary papers rarely mention more than half of what is included in the statistics as fiction. The *Dial* lists included 216 in 1914, 231 in 1915, and 212 in 1916, a result somewhat different from what one would have inferred from the general statistics.

Of this great number of novels and short stories a few present themselves to notice as "best sellers." Of these the following have been most popular: Booth Tarkington's *Seventeen* (Harpers); Eleanor H. Porter's *Just David* (Houghton, Mifflin Co.); Ellen Glasgow's *Life and Gabriella* (Doubleday, Page & Co.); Frank H. Spearman's *Nan of Music Mountain* (Scribners); Henry K. Webster's *The Real Adventure* (Bobbs-Merrill Co.); Jean Webster's *Dear Enemy* (Century Co.); Harold Bell Wright's *When a Man's a Man* (Book Supply Co.); Kathleen Norris's *The Heart of Rachel* (Doubleday, Page & Co.); Mary K. Rinehart's *Tish* (Houghton, Mifflin Co.); and Rupert Hughes's *Clipped Wings* (Harpers.) These names have appeared more than once on the monthly lists of best sellers, and some will appear oftener still, for the books published in the fall have not yet had time to make due impression on the public mind. The precise relation of these lists to literature is not known. They have now been published by the *Bookman* and the *Publishers' Weekly* for a good many years. A study of the best sellers in the past shows that many books once enormously popular have no claim to lasting remembrance. But this fact expresses merely one of the truisms of literary history. It is also the case that some best sellers are books of real value, and further that many books of real value never become best sellers. Still the lists show certain directions of popular interest and certain ways of meeting it.

There have been during the year a number of severe criticisms of American literature, some by Americans, some by others. The general point of such criticism has generally been either that our fiction is commercial,

such as will please our rather conventional and sentimental reading public, or else that it is not especially American, that it is rather a pale copy of foreign work. In the mass of fiction published, much will be found open to either one or the other criticism. But the books that have attracted more general attention are not apt to be at fault in either direction. They are generally very American in subject as well as in general style, and if they suffer from conventionality and sentimentality it is from sharing unconsciously in the common faults of our time as of most other times. Most of our better novels, nowadays, are of the kind that used to be called "realistic"; they are views of the life about us that we all know. A good many of them are strongly colored with the ideas that now interest people,—some of the best with different conceptions of the position and possibilities open to women in modern life. Ellen Glasgow's *Life and Gabriella* (Doubleday, Page & Co.) is the story of a Southern girl who, finding that she must leave her husband, makes a career for herself. Mrs. Deland's *The Rising Tide* (Harpers) presents with the author's usual clear-sighted sympathy the case of the ambitious girl who finds herself in revolt against the life about her. Henry K. Webster's *The Real Adventure* (Bobbs-Merrill Co.) gives the experience of a woman who feels that marriage cannot be true union unless a woman can feel herself a somebody who can be independent if necessary. Sara M. Cleghorn's *The Spinster* (Holt) is a girl who with the easy opportunity of comfortable marriage in pleasant circumstances chooses rather to make an individual career for herself. Others are stories of men, sometimes written with an idea of a "theory of life." G. A. Chamberlain's *John Bogardus* (Century Co.) tells the wanderings in search of experience of a young man who had been carefully trained for academic ease. Charles G. Norris's *Amateur* (Doran) shows the mistakes of a young man in the so-called artistic circles of New York. Willard H. Wright's *The Man of Promise* (Lane) is a rather hectic and conventional account of a youthful genius who felt that he must burst the barriers of current conventionalism and made a failure of it. Elias Tobenkin's *Witte Arrives* (Stokes) is a far more convincing record of a young immigrant who grew into a fine and true American. In some books the author has been interested chiefly in some definite phase of modern life, as in Nathan Kussy's *The Abyss* (Macmillans), which is a careful study, with here and there a touch of literary tradition, of the world of tramp, bum, and hobo; or in Kate L. Bosher's *People Like That* (Harpers), a somewhat less realistic story of "the other half"; or in Florence Olmstead's *Father Bernard's Parish* (Scribners), which presents through the medium of an engaging story the mixed population of upper New York; or in W. W. Wells's *The Whirligig of Time* (Stokes), which deals with student life. Quite by itself is Booth Tarkington's amusing and natural tale of boy life, *Seventeen* (Harpers). There are not so many stories of careful local color as there used to be. Grace King's *The Pleasant Ways of St. Médard* (Holt) is a beautiful and delicate picture of Louisiana at the close of the war, full of the sentiment of place and the spirit of the character that has made the new South. J. S. Dresser's *Gibbie of Clamshell Alley* (Dodd, Mead & Co.) is a fine story of a little boy in a New England fishing village. Joseph C. Lincoln's *Mary 'Gusta* (Appletons) is one of his well known Cape Cod stories, as amusing and true as any of his earlier work. But more books still have little especial idea or local color; they are simply stories of American life, told generally by people who know well the circumstances which they describe; if they have some definite idea concerning life it does little more than give direction to their work. Mrs. Watts's *The Rudder* (Macmillans) is a novel of central Ohio with a number of characters carefully studied and fully presented. Samuel Merwin's *The Trufflers* (Bobbs-Merrill Co.) is full of the present Bohemian atmosphere of Washington Square, but is well marked by the conviction that such life is merely a rooting about for enjoyment. Juliet W. Tompkins' *The Seed of the Righteous* (Bobbs-Merrill

Co.) is an excellent study of a family who have been so long traditionally engaged in works of philanthropy that they can not rid themselves of the idea that they have a great claim on the public. Basil King's *On the Side of the Angels* (Harpers) presents a married life in which a man marries one girl while loving another. Alice Brown's *The Prisoner* (Houghton, Mifflin Co.) is a story of New England life not much colored by the questions that might have arisen from the character who suggests the title to the book. Jack London's *The Little Lady in the Big House* (Macmillans) is a story of a superman and a superwoman who were content to live in California. Meredith Nicholson's *The Proof of the Pudding* (Houghton, Mifflin Co.) is one of his later interesting presentations of life in a city of Indiana. G. L. Richmond's *Under the Country Sky* (Doubleday, Page & Co.) is a very good love story with considerable feeling for the atmosphere suggested by the title. Stephen F. Whitman's *Children of Hope* (Century Co.) tells the adventures of a clever American family who went to Italy to spend a fortune that had fallen to them. Owen Johnson's *The Woman Gives* (Little, Brown & Co.) is rather an extravagant tale of redemption placed in a Bohemian atmosphere in New York. Philip Curtiss's *Between Two Worlds* (Harpers) is a really excellent story of a young man of wealth and position who was led to marry a vaudeville singer. F. O. Bartlett's *The Wall Street Girl* (Houghton, Mifflin Co.) is a somewhat more idyllic treatment of the same theme, except that in this case the girl is a stenographer in a broker's office. *Enoch Crane*, begun by F. Hopkinson Smith and finished by his son, F. Berkeley Smith (Scribners), is one of the author's stories of "old New York." *Those about Trench* by E. H. Lewis (Macmillans), one of the best books of the year, is an account of a set of medical students from all nations who have gathered about a famous doctor in Chicago.

It is probable that there are few enough masterpieces among the above, but they are not to be criticised as lacking in nationality. They are, like most good fiction nowadays, views of the particular life that the author happens to know and understand. There is no straining to make them "American," but on the other hand, except in a few places there is little foreign influence. Nor can they all in all be called commercial or sentimental. The authors have as a rule the habits of thought and feeling that are normal among us, and are therefore apt to take much the general view in regard to manners and morals that their readers do. It does not seem from their work that they consciously violate their sense of truth to please their readers or any one else.

There are few historical novels this year. W. D. Howell's *The Leatherwood God* (Century Co.), though colored by many recollections of his youth, is yet a historical picture of a singular and interesting phase in the life of our country. E. L. White's *El Supremo* (Duttons) is a very interesting and very carefully studied story of Dr. Francia, the dictator of Paraguay a hundred years ago. E. T. Harré's *Behold the Woman* (Lippincotts) is based on the story of Mary of Alexandria, but is swelled out by detail instead of being vitalized by historical imagination. F. P. Sullivan's *The Portion of a Champion* (Scribners) is a very successful rendering of the spirit of the old Celtic hero world. There are a few novels of American history, of which Emerson Hough's *The Magnificent Adventure* (Appletons) and Samuel McCoy's *Tippecanoe* (Bobbs-Merrill Co.) are best worth note.

There is slight lessening of the great number of stories of adventure and of mystery, but it must be confessed that they do not excite the notice that they did a while ago. Oswald Kendall's *The Romance of the Martin Connor* (Houghton, Mifflin Co.) has a gaiety of spirit and an eye for character that gives his book real quality. Stewart E. White in *The Leopard Woman* (Doubleday, Page & Co.), a story of the African veldt, is not quite as interesting as in his books on our American wilderness. Frank H. Spearman's *Nan of Music Mountain* (Scribners), despite some conventionalities, is the best of a number of "wild West" stories. For the rest we must be content to name: Rex Beach's *Rainbow's*

End (Harpers); Bertrand W. Sinclair's *Big Timber* (Little, Brown & Co.); B. M. Bowers's *The Phantom Herd* (Little, Brown & Co.); Harold Bindloss's *The Coast of Adventure* (Stokes); C. T. Brady's *Baby of the Frontier* and, with C. T. Brady, Jr., *The Web of Steel* (both Revell); Isabel B. Patterson's *The Shadow Riders* (Lane); Ridgewell Cullom's *The Golden Woman* (Jacobs); J. D. Curwood, *The Hunted Woman* (Doubleday, Page & Co.). From this list it will be seen that most of the well-known favorites are continuing their work. We put together a few books inspired by the European War. F. A. Kummer's *The Second Coming* (Dodd, Mead & Co.) presents the coming of our Lord to different representative people engaged in the present struggle. Cleveland Moffett's *The Conquest of America* (Doran) is what one would imagine from the title. The war has also inspired Robert W. Chambers in *The Girl Philippa* (Appletons), George B. McCutcheon in *From the Housetops* (Dodd, Mead & Co.), and Ridgewell Cullom in *The Men Who Wrought* (Jacobs). Of detective stories, the best worth mentioning is William MacHarg's and Edwin Balmer's *The Blind Man's Eyes* (Little, Brown & Co.), but those who cultivate this form of literature will be interested also in: Gertrude Atherton's *Mrs. Balfame* (Stokes); Geraldine Bonner's *The Black Eagle Mystery* (Appletons); Arthur Stringer's *The Door of Dread* (Bobbs-Merrill Co.); A. B. Reeve's *Constance Dunlap* (Hearst); Nevil M. Hopkins's *The Strange Cases of Mason Brandt* (Lippincotts); Percy J. Brebner's *The Master Detective* (Duttons).

There remain a number of books which do not fall readily into any of the above classifications, among them a number of the amusing extravaganzas that have always been found in our literature. Of these rather the most amusing is Alice Duer Miller's *Come Out of the Kitchen* (Century Co.), not, as might be imagined, a suffrage document, but the tale of a young man who rented a fine old Southern mansion, with service included. Charles Sherman's *Only Relatives Invited* (Bobbs-Merrill Co.) is an elaboration of the possibilities of divorce, and N. W. Putnam's *Adam's Garden* (Lippincotts) is the story of a young man who lived in a vacant lot in the upper part of New York City and was visited by a young lady in an aeroplane.

It will be remarked that a number of well known writers have published no novels in the period covered by this review, for instance, Henry S. Harrison, Winston Churchill, Edith Wharton, Robert Herrick, Mary Johnston, Willa S. Cather, Dorothy Canfield, Gene Stratton Porter, Frances Hodgson Burnett, Theodore Dreiser, among others.

Short Stories.—Americans have always liked to write and read short stories, for a variety of reasons, and some of the best of short stories are American. But so very many are published nowadays, chiefly in the periodicals, that no one can really do more than pick out a few for notice. Of the collections of short stories published during the year, two offer themselves at once as in marked contrast. *Xingu* by Mrs. Edith Wharton (Scribners) is (with the exception of two stories inspired by her life in France during the war, the best in the book) a collection of stories of modern society, fine and subtle relations of the rather sophisticated life that Mrs. Wharton has taken as her general subject. Jack Lait's *Beef, Iron and Wine* (Doubleday, Page & Co.), on the other hand, consists of short rapid daily cuts at life of a very different sort, the life of the police, the bum, the chorus girl, the gangster. Such things stand almost poles apart in story writing. Between them are to be found all sorts of variations. Jack London's *The Turtles of Tasman* (Macmillans), the last publication before his death, is a volume very representative of the varied interests in his spirited life. H. K. Webster's *The Painted Scene* (Bobbs-Merrill & Co.) is a first-rate collection of stories on a phase of life quite familiar to the writer, that which centers about a musical-comedy theatre. Hamlin Garland's *They of the High Trails* (Harpers) is an admirable collection of tales in the author's best vein, stories of the life of cowboy, prospector, farmer, in the upper levels of Montana. Booth Tarkington's *Penrod*

and Sam (Harpers) is a collection of chips left after hewing out his recent figure of the American boy. One can not do more than mention Irvin Cobb's *Local Color* (Doran), James B. Conolly's *Head Winds* (Scribners), a collection with more breadth and depth than is usual with him, Dorothy Canfield's *The Real Motive* (Holt), Rex Beach's *Crimson Gardenia* (Harpers). Finally, one should note the 81 prize *Short Stories from Life* (Doubleday, Page & Co.), a collection made from the 30,000 sent in response to an offer of a number of prizes.

Poetry.—The new currents of American poetry have grown in strength and fulness during the year. Beside new volumes there have been several collections of newer poetry, and one or two new periodicals have been founded, chiefly devoted to poetry. For many the chief volume of poetry of the year will be Edwin Arlington Robinson's *The Man against the Sky* (Macmillans). The book shows to advantage the author's gift for real character and real language. Others will prefer the very different *Songs and Satires* of Edgar Lee Masters (Macmillans), which is manifestly of the same stuff as his much talked-of volume of last year, *Spoon River Anthology*, although the lack of unity in form and conception detracts a little from its effect. Other volumes will best be grouped under the heads of older and younger poets. Of the former should be noted Edith M. Thomas' *The Flower from the Ashes* (Mosher Co.), Bliss Carman's *April Airs* (Small, Maynard & Co.), Robert U. Johnson's *Poems of War and Peace* (Bobbs-Merrill Co.), Josephine P. Peabody's *The Harvest Moon* (Houghton, Mifflin Co.), and Ella Wheeler Wilcox's *World Voices* (Hearst). It does not seem necessary to add a snatch of criticism to each of these, for their authors are well known and these volumes will not change their general reputation. Of the radicals of the newer school are to be mentioned Amy Lowell's *Men, Women and Ghosts* (Macmillans) and James Oppenheim's *War and Laughter* (Century Co.), as well as L. Untermeyer's —— *and Other Poets* (Holt), which latter will serve both for amusement to the lover of parody and help to the student of contemporary verse. Less representative of current tendencies but full of poetry are Hermann Hagedorn's *The Maze* (Macmillans) and Josephine Burr's *Life and Living* (Bobbs-Merrill Co.).

Biography.—There are a number of interesting autobiographies of interesting people. Charles Francis Adams's *An Autobiography* (Houghton, Mifflin Co.) is a sincere personal account of the life of a man representative of the best in American life at a time of deep importance to America. Charles A. Eastman's *From the Deep Woods to Civilization* (Houghton, Mifflin Co.) is the story of a Sioux Indian who educated himself and became an influential American citizen. Frederick W. Seward's *Reminiscences of a War-Time Statesman and Diplomat* (Putnams) contains the recollections of a man who had great opportunities to see what was occurring in the public life of the nineteenth century. *Notes of a Busy Life* by B. J. Foraker (Stewart & Kidd) is the autobiography of a well known political leader of our day, and being modestly and simply written, is full of things that will do much to improve one's ideas on political history. Edward L. Trudeau's *Autobiography* (Doubleday, Page & Co.) is the record of the famous doctor of Saranac Lake who is so warmly remembered for his work in aid of those afflicted with what used to be one of the great scourges of America. *The Letters of Richard Watson Gilder*, edited by Rosamond Gilder (Houghton, Mifflin Co.), gives a personal view of one who was not only the editor of a great periodical but a poet on the one hand and a man deeply interested in public life on the other. Beside these and other autobiographies there are a number of biographies written largely on the basis of letters, journals, etc., which partake largely of the autobiographic character. Most important among these are the lives of Mrs. Julia Ward Howe and of Booker T. Washington. The former is by two daughters, Laura E. Richards and Maud H. Elliott (Houghton, Mifflin Co.), and presents in an autobiography and letters a singularly interesting account of one of the leading women of the nineteenth century. *The Life of Booker T.*

Washington by Emmet J. Scott and Lyman B. Stowe (Doubleday, Page & Co.) gives a life of the great negro educator from personal sources. Here also is to be mentioned H. B. Rankin's *Personal Recollections of Abraham Lincoln* (Putnams), a book which not only presents some new details on the life of the great President but gives new comment on matter already known. Of definite biography there is not very much. Two volumes of the careful studies of Gamaliel Bradford, *Union Portraits* and *Portraits of Women* (Houghton, Mifflin Co.) will add to his reputation in this direction. Among longer careful studies are Albert J. Beveridge's *The Life of John Marshall* (Houghton, Mifflin Co.), which presents only the beginning of the career of the great jurist, and Charles S. Olcott's *Life of William McKinley* (Houghton, Mifflin Co.)

Essays and Criticism.—The essays of the year may be separated into those which follow the literary form of the essay with the desire of expressing general thoughts and ideas in life, and those which use the essay as a medium for the presenting of definite schemes of thought. Of the former the most noteworthy are *The Pleasures of an Absentee Landlord* by S. McC. Crothers (Houghton, Mifflin Co.), an essayist of well known distinction, and *Counter Currents* by Agnes Repplier (Houghton, Mifflin Co.), who here goes rather deeper than her wont into the questions of contemporary life. Of the latter kind the most noteworthy are *Under the Apple Trees* by John Burroughs (Houghton, Mifflin Co.), a collection of wide range but in the main illustrating the author's later thought on the philosophy of life; *Problems of American Government* by Elihu Root (Harvard University Press), a series of studies by one of the clearest of American political thinkers; and *Estimates in Art* by F. J. Mather (Scribners), a collection of excellent critical studies by one who has not only a wide range of knowledge and interest, but also a firm hold on fundamental ideas. Of importance also is Elizabeth L. Pennell's *Nights* (Lippincotts), personal reminiscences of the art and literature of the end of the nineteenth century by one who had remarkable opportunities to know the leading workers in art and letters and the leading currents of thought. There has been published, of course, a good deal of literary study and criticism, of which may be mentioned favorably, the semi-popular *How to Know Wordsworth* by C. T. Winchester (Bobbs-Merrill Co.), with the books in the same series on *Dante* by A. M. Brooks and *DeFoe* by William P. Trent (see also *English Language and Literature, infra*).

Necrology.—Several well-known authors have died during the year. On Feb. 1 Henry James died at Rye, England; although he had become a British subject he was still regarded as one of the great figures of our national literature. The following also are to be noted: John T. Trowbridge, Feb. 12; Richard Harding Davis, April 11; Jean Webster, June 11; James Whitcomb Riley, July 22; Josiah Royce, Sept. 14; Frank Dempster Sherman, Sept. 19; Norman Duncan, Oct. 18; Mollie Elliott Seawell, Nov. 15; Jack London, Nov. 22.

MODERN LANGUAGES AND LITERATURE

ENGLISH LANGUAGE AND LITERATURE

ALBERT C. BAUGH

The most noticeable characteristic of American scholarship during 1916 in the field of English philology and literature is its abundance. As yet the war, though it has increased the difficulties of research, has not appreciably affected the productivity of American scholars. The work of some American students published in periodicals like *Anglia* and *Englische Studien*, however, must be omitted in the following *résumé* because of the inaccessibility of recent numbers of these publications. All other omissions, if they are intentional, are made necessary by lack of space.

English Philology.—The number of philological papers published during the year is rather small. Francis A. Wood treats "Old English Diphthongs in Middle and New English" (*Jour. of Eng. and Germ. Phil.*),

Prof. Bright discusses "Anglo-Saxon 'umbor' and 'seld-guma'" (*Mod. Lang. Notes*), and C. M. Lotspeich illustrates the physical principle which he thinks is involved in Verner's law in a note on the "Pronunciation of -tu- in English" (*Jour. Eng. and Germ. Phil.*). A. G. Kennedy treats *The Pronoun of Address in English Literature of the Thirteenth Century*, and O. F. Emerson writes on "English or French in the Time of Edward III" (*Romanic Rev.*). In the Shakespearean period H. M. Ayres discusses *The Question of Shakespeare's Pronunciation*, and M. P. Tilley collects "Some Evidence in Shakespeare of Contemporary Effort to Refine the Language of the Day" (*Pub. Mod. Lang. Assoc.*).

Old English Literature (449-1150).—Touching the *Beowulf*, Fr. Klaeber has published "Observations on the Finn Episode" (*Jour. Eng. and Germ. Phil.*), and Professor Bright has discussed "Beowulf 489-490" (*Mod. Lang. Notes*). Cynewulf has been the subject of several contributions, including Samuel Moore's "The Old English *Christ:* Is It a Unit?" (*Jour. Eng. and Germ. Phil.*), Miss A. M. Jenney's "A Note on Cynewulf's 'Christ'" (*Mod. Lang. Notes*), G. H. Gerould's "Cynewulf's 'Christ,' 678-679" (*ibid.*), B. S. Monroe's "The Anglo-Saxon *Juliana*" and "Notes on the Anglo-Saxon Andreas" (*ibid.*).

Middle English Literature (1150-1500).—In the general period of Middle-English literature a long-felt need has been supplied by J. E. Wells, *A Manual of the Writings in Middle English, 1050-1400.* A convenient volume of translations has been published by W. A. Neilson and K. G. T. Webster under the title, *Chief British Poets of the Fourteenth and Fifteenth Centuries.* Numerous notes and articles on individual works and topics have appeared. Miss H. E. Allen prints "Two Middle-English Translations from the Anglo-Norman" (*Mod. Phil.*) and contributes "A Note on the Lamentation of Mary" (*ibid.*). F. A. Patterson prints "A Sermon on the Lord's Prayer" (*Jour. Eng. and Germ. Phil.*), and Miss G. H. Campbell publishes texts of "The Middle English *Evangelie*" (*Pub. Mod. Lang. Assoc.*). "Hitherto Unprinted Manuscripts of the Middle English *Ipotis*" have been edited by Miss J. D. Sutton (*ibid.*). R. B. Pace's "The Death of the Red Knight in the Story of Perceval" (*Mod. Lang. Notes*) and W. C. Curry's "The Judgment of Paris" (*ibid.*) treat subjects touching the Middle-English romance. A valuable study of the *Saints' Legends* has been published by G. H. Gerould ("Types of Eng. Lit. Series"), and the author of this volume has also discussed "The Source of the Middle English Prose Saint Elizabeth of Spalbeck" (*Anglia*). Two important contributions to the literature of "Sir Gawain and the Green Knight" have appeared during the year, one a book by Professor Kittredge which he calls *A Study of Gawain and the Green Knight*, the other an article by J. R. Hulbert entitled simply "Syr Gawayn and the Grene Knyght" (*Mod. Phil.*). "More Notes on 'Patience'" have come from O. F. Emerson (*Mod. Lang. Notes*) and Professor Manly notes a query of the late Professor Marsh on "The Authorship of Piers the Plowman" (*Mod. Phil.*).

A number of publications relating to Chaucer are evidence of the continued interest of American scholars in a field which they have made so much their own. With a few exceptions, however, the work of the year has not been quite so significant as that of 1915. Frederick Tupper has continued to maintain his sins-theory in "Chaucer's Sinners and Sins" (*Jour. Eng. and Germ. Phil.*). J. L. Kenyon makes "Further Notes on the Marriage Group in the Canterbury Tales" (*ibid.*). Several articles treat of Chaucer's relation to other writers. H. M. Cummings' "The Indebtedness of Chaucer's Works to the Italian Works of Boccaccio" (*Univ. of Cincinnati Studies*), Miss H. Seibert's "Chaucer and Horace" (*Mod. Lang. Notes*), and J. S. P. Tatlock's "Chaucer and Wyclif" (*ibid.*) may be mentioned. The latter also discusses "'Bretherhed' in Chaucer's 'Prolog'" (*ibid.*) and Miss E. P. Hammond writes on "Chaucer and Dante and Their Scribes" (*ibid.*). Professor Tupper has made an interesting contribution on "Chaucer and Trophee" (*ibid.*) which is

supplemented by O. F. Emerson's "Seith Trophee" (*ibid.*). Tupper has also rediscovered in "Chaucer and Richmond" some things that were suggested in 1894 in the *Academy*, and a similar rediscovery appears in H. J. Savage's supplementary note, "Chaucer's 'Long Castel'" (both in *Mod. Lang. Notes*). In "Hereos Again" J. L. Lowes adds a note to his earlier discussion of the point (*ibid.*), and Carleton Brown has discussed "Chaucer and the Hours of the Blessed Virgin" (*ibid.*). A number of notes and articles by Prof. A. S. Cook may be mentioned: "Skelton's 'Garland of Laurel' and Chaucer's 'House of Fame'" (*Mod. Lang. Notes*), "Chaucer's *fraknes*" (*ibid.*), "Two Notes on Chaucer" (*ibid.*), and "The Historical Background of Chaucer's Knight" (*Trans. Conn. Acad.*). Finally, this summary of Chaucerian scholarship may be brought to a close with mention of H. B. Hinckley's "Chauceriana" (*Mod. Phil.*).

Of Middle-English literature subsequent to Chaucer, J. M. Berdan discusses "The Poetry of Skelton, a Renaissance Survival of Medieval Latin Influence" (*Romanic Rev.*), and Miss Hammond contributes a note on "*The Lover's Mass* in England and Spain" (*Mod. Phil.*). Concerning the ballad, S. B. Hustvedt has had published by the American Scandinavian Foundation *Ballad Criticism in Scandinavia and Great Britain during the Eighteenth Century*. "The English Ballad of Judas Iscariot" is discussed by P. F. Baum, who has treated also "The Medieval Legend of Judas Iscariot" (both in *Pub. Mod. Lang. Assoc.*). W. H. Schofield's "The Chief Historical Error in Barbour's *Bruce*" (*ibid.*) may be put here. The early history of the drama has received considerable attention. Mention must be made of F. G. Calderhead's "Morality Fragments from Norfolk" (*Mod. Phil.*), Carleton Brown's "The Towneley 'Play of the Doctors' and the 'Speculum Christiani'" (*Mod. Lang. Notes*), R. G. Coffman's "The Miracle Play in England—Nomenclature" (*Pub. Mod. Lang. Assoc.*), W. K. Smart's "Some Notes on *Mankind*" and A. S. Cook's "Another Parallel to the Mak Story" (both in *Mod. Phil.*).

Modern English Literature (since 1500).—The interest which American scholars have shown in Spenser during the last few years continues to increase. As a result of this interest we now have *A Concordance to the Poems of Edmund Spenser* by C. G. Osgood. "Spenser's Birth-date" and "Spenseriana: The Lay of Corinda" are notes by P. W. Long in *Mod. Lang. Notes*. Miss J. M. Lyons discusses "Spenser's *Muiopotmos* as an Allegory" (*Pub. Mod. Lang. Assoc.*), and J. Erskine treats "The Virtue of Friendship in the *Faerie Queene*" (*ibid.*). F. M. Padelford's "Spenser and the Spirit of Puritanism" (*Mod. Phil.*), R. Bolwell's "Notes on Alliteration in Spenser" (*Jour. Eng. and Germ. Phil.*) and E. Fulton's "Spenser, Sidney, and the Areopagus" (*Mod. Lang. Notes*) may also be mentioned. G. P. Krapp's *The Rise of English Literary Prose* treats the history of English prose up to Bacon. T. K. Whipple connects "Isocrates and Euphuism" (*Mod. Lang. Rev.*). *Elizabethan Translations from the Italian* is the title of a volume by Miss M. A. Scott. Milton has received considerable attention during the year. E. N. S. Thompson has published *John Milton: A Topical Bibliography*, and F. M. Darnall has discussed "Milton's *L'Allegro* and *Il Penseroso*" (*Mod. Lang. Rev.*). The latter is the title of a brief note by A. Thaler, who has published also a note on "Milton and Thompson" (*Mod. Lang. Notes*). W. F. Warren's *The Universe as Pictured in Milton's Paradise Lost*, and Miss M. Barstow's "Milton's Use of the Forms of Epic Address" (*Mod. Lang. Notes*) may receive notice in this connection.

Because of the popular interest in the celebration of the tercentenary of Shakespeare's death, Shakespeare and the Elizabethan drama have received unusual attention during the year. Among more general works, Arthur B. Stonex has published his excellent study of "The Usurer in Elizabethan Drama" (*Pub. Mod. Lang. Assoc.*), V. S. Frieburg has examined *Disguise Plots in Elizabethan Drama*, and J. S. P. Tatlock has studied "The Siege of Troy in English Literature, Especially in Shakespeare and Hey-

wood" (*Pub. Mod. Lang. Assoc.*). The early history of the masque is touched on by R. Withington in "After the Manner of Italy" (*Jour. Eng. and Germ. Phil.*), and C. R. Baskerville presents "Some Evidence for Early Romantic Plays in England" (*Mod. Phil.*). The same writer discusses "John Rastell's Dramatic Activities" (*ibid.*) and H. N. Hillebrand treats "Sebastian Westcote, Dramatist and Master of the Children of Paul's" (*Jour. Eng. and Germ. Phil.*). "The Authorship of *Gorboduc*" is an interesting note by J. E. Gillet (*Mod. Lang. Notes*). *Common Conditions*, an early play, has been edited by C. J. Tucker-Brooke as the first of the Yale Elizabethan Club Reprints. The connection between *Froissart and the English Chronicle Play* has been investigated by R. M. Smith.

A number of notable works on Shakespeare have been published in the anniversary year. A. W. Pollard and Miss H. C. Bartlett have compiled *A Census of Shakespeare's Plays in Quarto*. More immediately connected with the tercentenary celebration are the address by Professor Kittredge and the volumes of miscellaneous contributions published especially to commemorate the event. *Shakespeare's England* is an English publication, as is also the elaborate *Book of Homage to Shakespeare* edited by I. Gollancz. But the latter work contains numerous contributions by American scholars, including an important paper by Professor Schelling on "The Common Folk of Shakespeare" and others by Professors Manly, Brander Matthews, Phelps, Mr. H. H. Furness, Jr., etc. Two somewhat similar volumes have been published in America: *Shakesperian Studies by Members of the Department of English and Comparative Literature in Columbia University;* and *Shakespeare Studies by Members of the Department of English of the University of Wisconsin*. The latter especially contains some significant articles on the Elizabethan drama. Attention may be directed to F. G. Hubbard's "Locrine and Selinus," J. R. Moore's "The Function of the Songs in Shakespeare's Plays," Karl Young's "An Elizabethan Defense of the Stage," T. H. Dickinson's "Some Principles of Shakespeare Staging," and Louis Wann's "The Collaboration of Beaumont, Fletcher and Massinger." Independent studies of separate plays have appeared such as E. E. Stoll's *Othello: an Historical and Comparative Study*, T. S. Graves' paper "On the Date and Significance of *Pericles*" (*Mod. Phil.*), and W. Graham's "The Cardenio-Double Falsehood Problem" (*ibid.*). Briefer notes on *Hamlet, Love's Labours Lost*, and *All's Well That Ends Well* will be found in *Mod. Lang. Notes*. The technique of the stage in Elizabethan times is treated in A. H. Thorndyke's *Shakespearean Theatre*, and in somewhat more popular form in O. L. Hatcher's *A Book for Shakespeare Plays and Pageants*. T. S. Graves in "The 'Act-Time' in Elizabethan Theatres" (*Univ. of N. Carolina Studies in Phil.*) settles an important question, and Miss Charlotte Porter explains "How Shakespeare Set and Struck the Scene for *Julius Cæsar* in 1599" (*Mod. Lang. Notes*). Space does not permit the mention of some recent Baconian literature which continues to appear in spite of such articles as John Munro's "More Shakspere Allusions" (*Mod. Phil.*). Apart from the drama, R. M. Alden has published a variorum edition of *The Sonnets of Shakespeare* and contributed two articles on "The 1640 Text of Shakespeare's Sonnets" (*Mod. Phil.*) and "The 1710 and 1714 Texts of Shakespeare's Poems" (*Mod. Lang. Notes*).

In turning from Shakespeare to his contemporaries in the drama we may note two books, D. H. Madden's *Shakespeare and His Fellows* and J. C. Jordan's *Robert Greene*. Greene has been the subject also of three articles in the magazines: C. W. Lemmi, "The Sources of Greene's *Orlando Furioso*" (*Mod. Lang. Notes*), H. D. Gray, "Greene as a Collaborator" (*ibid.*), and Miss E. M. Albright, "Eating a Citation" (*ibid.*). Ben Jonson is represented by several articles, the chief of which are W. D. Briggs' "Studies in Ben Jonson" (*Anglia*), the same author's "Source-Material for Jonson's Plays" (*Mod. Lang. Notes*), and A. B. Stonex's "The Sources of Jonson's *The Staple of*

News" (*Pub. Mod. Lang. Assoc.*). W. E. Farnham has examined the "Colloquial Contractions in Beaumont, Fletcher, Massinger, and Shakespeare as a Test of Authorship" (*ibid.*). Various anonymous plays have been the subject of study. H. M. Ayres discusses "*Cæsar's Revenge*" (*ibid.*), J. Q. Adams, Jr. treats "Captain Thomas Stukeley" (*Jour. Eng. and Germ. Phil.*), and C. R. Baskerville is to be read "On Two Old Plays," *Old Custom* and *A Fig for a Spaniard* (*Mod. Phil.*).

Later seventeenth and eighteenth century verse has recently had greater attention paid to it. J. W. Good has issued a volume of *Studies in the Milton Tradition*, and C. L. Powell has made known some "New Material on Thomas Carew" (*Mod. Lang. Rev.*). Miss C. Rinaker's "Thomas Edward's Sonnets" (*Mod. Lang. Notes*) and E. B. Reed's "Herrick and *Naps upon Parnassus*" (*ibid.*) are notes in the period. M. E. Smith treats "The Fable and Kindred Forms" (*Jour. Eng. and Germ. Phil.*) and adds "Notes on the Rimed Fable in England" (*Mod. Lang. Notes*). The "Non Dramatic Pastoral in Europe in the Eighteenth Century" is the title of an article by H. E. Mantz (*Pub. Mod. Lang. Assoc.*). A. H. Shearer discusses "Theophania: An English Political Romance of the Seventeenth Century" (*Mod. Lang. Notes*), C. A. Moore treats "Shaftsbury and the Ethical Poets in England, 1700-1760" (*Pub. Mod. Lang. Assoc.*), and E. Osborne examines the poetry of the period for "Oriental Diction and Theme in English Poetry, 1740-1840" (*Univ. of Kansas Humanistic Studies*).

The post-Elizabethan drama continues to attract a steadily increasing number of students. F. and J. W. Tupper have edited a collection of *Representative English Dramas from Dryden to Sheridan*. G. P. Dutton takes up "Theory and Practice in English Tragedy, 1650-1700" (*Englische Studien*), E. Bernbaum studies *The Drama of Sensibility, 1696-1780*, and C. S. Duncan writes on "The Scientist as a Comic Type" in the drama (*Mod. Phil.*). "Congreve as a Romanticist" is treated by H. S. Canby (*Pub. Mod. Lang. Assoc.*), and the opinions of *Pepys on the Restoration Stage* have been collected by Miss Helen McAfee. Under the title, "A Bluestocking of the Restoration," P. E. More has contributed an interesting paper to the *Nation* on Mrs. Aphra Behn.

English fiction receives treatment at the hands of W. L. Phelps, *The Advance of the English Novel*, and its beginnings are touched on in two papers: A. H. Upham's "Notes on Early English Prose Fiction" (*Mod. Lang. Notes*), and E. B. Reed's reprint of "Three Characters by Henry Molle" (*ibid.*). *The French Revolution and the English Novel* is the title of a book by Allene Gregory tracing an important influence on English fiction. H. M. Dargan discusses "The Nature of Allegory as Used by Swift" (*Univ. of N. Carolina Studies in Phil.*) and J. M. Thomas writes on "Swift and the Stamp Act of 1712" (*Pub. Mod. Lang. Assoc.*). An excellent book on its subject is W. P. Trent's *Defoe: How to Know Him*. Fielding's *Covent-Garden Journal* has been edited by G. E. Jensen in two volumes. Jensen has also written on "Fashionable Society in Fielding's Time" (*Pub. Mod. Lang. Assoc.*) and has discussed in *Mod. Lang. Notes* "The Crisis: A Sermon" and "An Apology for the Life of Mrs. Shamela Andrews, 1741," both of which have been attributed to Fielding. Other studies in the novel that may be noted are J. B. Barton's "Laurence Sterne and Charles Nodier" (*Mod. Phil.*), G. F. Whicher's volume, *The Life and Romances of Mrs. Eliza Haywood*, and W. T. Hale's *Madame D'Arblay's Place in the Development of the English Novel*.

A few other works concerning later periods will suffice to complete this survey. G. F. Richardson treats *A Neglected Aspect of the English Romantic Revolt* (*Univ. of Cal. Pub.*), and S. C. Chew asks "Did Byron write *'A Farrago Libelli'?*" (*Mod. Lang. Notes*). An elaborate biography of Wordsworth in two volumes has been published by G. M. Harper with the title *William Wordsworth: His Life, Works and Influence*. The latest volume of the *Cambridge History of English Literature* contains one contribution by an American, the chapter on *Hazlitt* by W. D. Howe. Bliss Perry's *Thomas Carlyle: How to*

Know Him and W. L. Phelps' *Robert Browning: How to Know Him* are volumes in the same series with Trent's book on Defoe, mentioned above. Wm. Chislet, Jr. has written on "Stevenson and the Classics, 1850-1894" (*Jour. Eng. and Germ. Phil.*), H. L. Cohen has treated *The Ballade*, and F. N. Scott has discussed "Vowel Alliteration in Modern Poetry" (*Mod. Lang. Notes*). Among books of a more general character, Lane Cooper's *Methods and Aims in the Study of Literature*, C. E. Whitmore's *The Supernatural in Tragedy*, Miss L. J. Wylie's *Social Studies in English Literature*, T. De Vries' *Holland's Influence on the English Language and Literature*, and P. H. Boynton's *London in English Literature* help to increase the bulk of work done by American scholars, in spite of unfavorable conditions, and to mark the year as one unusually productive in American scholarship.

GERMANIC LANGUAGES AND LITERATURE

DANIEL B. SHUMWAY

German Fiction and Drama.—The interest aroused in the drama through the work of the Drama League and kindred organisations is shown by the number of translations of German and Scandinavian dramas during the year. Thus, Max Halbe's powerful tragedy *Youth* (*Jugend*) and George Hirschfeld's problem play *Mothers* (*Mütter*) have both been translated by Ludwig Lewisohn for the Drama League Series (Doubleday). Hugo von Hofmannsthal's verse drama *Madonna Dianora* has been rendered into English by Harriet B. Boas for the Contemporary Dramatists Series (Badger). The sixth volume of Hauptmann's dramatic works, edited by Lewisohn, has been published by Huebsch; it is entitled *Later Dramas in Prose* and contains *The Maidens of the Mount, Griselda* and *Gabriel Schilling's Flight*. Wedekind's *Erdgeist* is reviewed in the *New Republic* of April 22, and Hauptmann's *Weavers* is the subject of several brief notices in the *New Republic* (Dec. 25, 1915), *Nation* (Dec. 30, 1915) and *Current Opinion* (March). P. M. Buck discusses *Hauptmann and Tragedy* (*Nation*, June 16). In an article *Arthur Schnitzlers dramatische Werke* (*Germanistic Quarterly*, iii, 106) M. G. Beach points out that Schnitzler has much of Schopenhauer's philosophy but not his pessimism. Robert A. Falconer has written on *German Tragedy and Its Meaning for Canada* (*Univ. of Toronto Press*). In two interesting articles on "Literary Adaptations in Hauptmann's *Versunkene Glocke*" (*Germanistic Quart.*, March and June) Henry Wood has shown the dramatist's indebtedness to various works of Mörike in the creation of his main characters.

In the field of fiction, very few German novels have been rendered into English. The most important is Wolzogen's satirical novel *Third Sex* (*Das dritte Geschlecht*) translated for Macauley & Co. Friedrich Friedrich's popular novel *Obstinate Maid* has been translated from the twenty-first German edition by May E. Ireland (Jacobs). Heinrich Heine's fascinating *Nordseebilder* have been rendered under the title *North Sea* by H. M. Jones (Open Court Pub. Co.) G. C. L. Riemer has translated Gustav Freytag's famous essay on *Dr. Luther* for the Lutheran Publishing Co. Rolf Weber has a well written article *"Das religiöse Problem bei Gerhart Hauptmann,"* discussing Hauptmann's religious views in his novel *Emanuel Quint* and other works (*Jour. Eng. and Germ. Phil.*, xv, 390). Friedrich Schoenemann, *"Deutsche und Amerikanische Romane,"* I (*Germanistic Quart.*, iii, 96), begins a brief study of the novels of these two nations. O. W. Long, "English and American Imitators of Goethe's Werther" (*Mod. Phil.*, Aug., 193) discusses various poems, novels and satires which owe their inspiration to Goethe's youthful work.

Lyrics are well represented in the year's activities. A selection of Goethe's poems has been edited by Martin Schuetze with a study of the development of Goethe's art and view of life (Ginn & Co.). Margaret Münsterberg has published a number of her admirable translations under the title *A Harvest of German Verse* (Appletons). H. L. Fiedler has prepared a *Book of German Verse from Luther*

to Liliencron (Oxford Univ. Press). M. E. Weber has collected *Passages in Prose and Verse from German Literature of the Nineteenth Century* (Putnams). L. Lewisohn has published a volume on the *Spirit of Modern German Literature* (Hübsch), and C. H. Towne has written on the "Lyrics of the Fatherland" (*Bookman*, Oct., 125). A poem by Ludwig Fulda, "In the Express Train," appeared in the *Bookman* for October (p. 12) and three songs from Heine have been translated by A. Gray (*Living Age*, Sept. 16, 706). "German Poets and the War" is the subject of a short article in *Living Age* (April 15). P. S. Barto has a volume *Tannhäuser and the Mountain of Venus* (Oxford Univ. Press). Charles W. Stork has treated "Hofmannsthal as a Lyric Poet" (*Nation*, May 18). "Goethe and Eckermann" is the subject of an article in the *Unpopular Review* for July (p. 73).

Of essays on German literature there are a goodly number. H. D. Sedgwick treats the waning influence of Goethe under the caption "A Forsaken God" (*Atlantic Monthly*, March, 346). Frederick A. Braun, "Goethe as Viewed by Emerson" (*Jour. Eng. and Germ. Phil.*, Jan., 23) has sketched the development of Emerson's opinions of Goethe from unstinted condemnation to strong admiration. Julius Goebel discusses the meaning of Goethe's poetical fragment *Geheimnisse* (*ibid.*, July, 335). Edw. Hauch sketches *Gottfried Keller as a Dreamer and Idealist* (Columbia Univ. Press). A. Kenngott treats the Swiss hero *Jürg Jenatsch in Geschichte, Roman und Drama* (Washington Univ. Ser. 4, vol. ii). "Schiller's Influence on Goethe's Novel Wilhelm Meisters Lehrjahre" is the subject of an article by O. E. Plath (*Mod. Lang. Notes*, May, 257). Ernst Feise has investigated the metrical forms of Schiller's *Lied von der Glocke* (*Jour. Eng. and Germ. Phil.*, April, 213). G. P. Jackson has continued his study of the "Rhythmic Form of the German Folksongs" (*Mod. Phil., June*, 65). A. O. Lovejoy has discussed the "Meaning of 'Romantic' in Early German Romanticism," I (*Mod. Lang. Notes*, Nov., 385). In an article entitled "Drama und Epos in der deutschen Renaissance" (*Jour. Eng. and Germ. Phil.*, Jan., 35), Jos. E. Gillet shows that previous to the advent of the English comedians in Germany the German dramas were written to be read rather than to be performed. Kuno Franke has published an interesting study on *Personality in German Literature before Luther* (Harvard Univ. Press). Finally, Emma G. Jaeck has discussed *Mme. de Stael and the Spread of German Literature* (Oxford Univ. Press).

German Philology.—In the general field T. W. Arnoldson has published a study on the *Parts of the Body in Older Germanic and Scandinavian* (Univ. of Chicago Press). E. H. Sehrt has made an exhaustive investigation *"Zur Geschichte der Westgermanischen Konjunktion 'Und'"* (*Hesperia*, No. 8) and also written an article on "Grimmelshausen as Dialectologer" (*Mod. Lang. Notes*, June, 338) showing the novelist's thorough knowledge of German dialects. H. O. Schwabe continues his study of the "Germanic Coin Names" (*Mod. Phil.*, June, 105). F. A. Wood, "Some Verb Forms in Germanic" (*ibid.*, June, 121), has treated the survival of the injunctive, the dual, the ē aorist in Germanic and of the West-Germanic form *deda*. C. Reining has a study of *Verbs compounded with "aus," "ein," etc., as contrasted with those compounded with "heraus," "hinaus," "herein," "hinein," etc.* (Leland Stanford Univ.). In the field of Gothic, A. Green and L. Bloomfield in a long review of Wiener's *Commentary to the Germanic Laws and Medieval Documents* (*Jour. Eng. and Germ. Phil.*, April, 293) have convincingly shown the untenable character of Wiener's iconoclastic views concerning Gothic and the unsoundness of his method of procedure. In Old High German P. R. Kolbe treats the "Strophic Form of the *Georgslied*" in his third article on "Variation in the O. H. G. Post-Otfridian Poems" (*Mod. Lang. Notes*, Jan., 19). A. M. Sturtevant discusses the *"Syntax des Verbums 'Meinen' im ahd."* (*Mod. Lang. Notes*, Feb., 85.) In Middle High German P. S. Barto, *"Der Sitz von König Artus Hof im Wartburgkrieg und Lohengrin"* (*Jour. Eng. and Germ.*

Phil., xv, 377), discusses the Germanic idea that mysterious personages have their seats in mountains. In a similar article entitled "*Elementargeister* as Literary Characters in M. H. G. Epics" (*ibid.*, April, 177), H. W. Puckett interestingly shows that fairies rarely appear in these poems, but that such creatures as dwarfs, giants, mermaids and wild men and women are to be met with in abundance. H. W. Church, "The Compound Tenses in Middle High German" (*Jour. Eng. and Germ. Phil.*, Jan., 1), shows that in general the same distinctions between the perfect and preterite were made then as today.

German Texts and Teaching.—In this field another edition of Grillparzer's *Des Meeres und der Liebe Wellen* has been prepared by J. L. Kind for the Oxford Series. An abbreviated edition of Otto Ernst's charming autobiographical novel *Asmus Sempers Jugendland* has been edited by Carl Osthaus (Heath). Many new editions of short German stories and new German readers have appeared, but lack of space forbids mentioning them by name. The following have issued German grammars: P. S. Allen (Ginn), Paul V. Bacon (Allyn), M. B. Evans and H. C. Keidel (Adams), E. Otto (Stechert), E. Otto and J. Wright (Stechert). In the field of pedagogy O. T. Thwing is represented by a well written article on "Education According to Goethe" (*School and Society*, April 8, 505). James M. Andress has written on *Herder as an Educator* (Stechert) and Carl A. Krause discusses his favorite topic, "Why the Direct Method for a Modern Language?" (*Educational Rev.*, March.) A. W. Porterfield has an article on the "Study of German in the Future" (*School and Society*, Sept. 23,473) and S. Bluhm on "Education in the New Germany" (*ibid.*, Sept. 30, 503).

German-American Relations.—This field is well represented. The war has produced a large number of lyrics in this country which have been collected by Irving T. Sanders under the title *Aus Ruhmreicher Zeit* (Stechert). George Sylvester Viereck, the ablest of German-American poets, has likewise issued poems inspired by the war under the caption *Songs of Armageddon and Other Poems* (Kennerly). Rudolf E. Rehbach has published a volume entitled *Mariae Höllenfahrt und Andere Gedichte* (Stechert). In the drama, Charles F. Brede continues his study of the "German Drama on the Philadelphia Stage to 1830" (*German-American Annals*, xviii, 60), and Louis C. Baker concludes his investigation of the "German Drama on the New York Stage to 1830" (*ibid.*, 3). John T. Geissendoerfer discusses Dickens' influence on Raabe, Ebner-Eschenbach and other German novelists (*Germanica Americana*, No. 19). Iola K. Eastburn has treated "Whittier's Relation to German Life and Thought" (*ibid.*, No. 20). An exceedingly able study on "Benjamin Franklin and Germany" has been made by Beatrice M. Victory (*ibid.*, vol. 21). In three well written articles on "*Die Deutschen im öffentlichen Leben der Vereinigten Staaten 1848-1865*" (*Germanistic Quart.*, Dec., 1915-June, 1916), G. A. Betz has sketched the attitude of the German-Americans to the different political parties of the period and their opposition to slavery. Charles F. Dapp gives a biographical sketch of the German printer and publisher Johann Heinrich Miller, who was at one time associated with Benjamin Franklin (*German-American Annals*, xviii, 118). Camillo von Klenze has published a thoughtful discussion of *Die Zukunft der Deutschen Kultur in Amerika* (Stechert). The year book of the German-American Historical Society of Illinois also contains a number of articles on German-American relations.

Swedish.—That the interest in Strindberg is undiminished is evinced by the appearance of the *Plays of the Fourth Series*, comprising *The Bridal Crown, The Spook Sonata, The First Warning* and *Gustav Wasa*, translated by Edwin Björkman (Scribners), and by a volume containing *Swanwhite, Advent* and *The Storm*, translated by Edith and Warner Oland (Luce). Charles Wharton Stork, who so ably translated German lyrics for the *German Classics of the Nineteenth Century*, has added to his reputation by most acceptably rendering *Selected Poems of Gustav Fröding*, a poet all too little known in

this country (Macmillans). Amandus Johnson has issued an abridgement of his larger work under the title *Swedes on the Delaware*. The well known essayist Ellen Key is represented by an article on "War and the Sexes" (*Atlantic Monthly*, June, 837). A few notes on Selma Lagerlöf appeared in the *Bookman* (Sept., 37). A number of new poems in Swedish have been published by Julius B. Baumann under the title *Fra Vidderne* (Augsburg Pub. Co.). Swedish grammars have been written by H. Fort (Stechert) and A. May (Stechert), while A. L. Elmquist has written on *Swedish Phonology*.

Norwegian.—Ibsen as usual heads the list in this field. His *Peer Gynt* has been translated in the original metres by R. E. Roberts (Modern Drama Series), his *Brand* rendered by F. E. Garrett (Everyman's Library, Dutton), and his *Kongsemnerne*, edited for school use by J. A. Holvik and P. J. Eikeland (Augsburg Pub. Co.). W. E. Jenkins has prepared an historical sketch entitled *Before and After Ibsen* for the Drama League. C. J. Little has written *Biographical and Literary Studies on Ibsen* (Abingdon Press). A. Leroy Andrews in "Further Influences on Ibsen's Peer Gynt" (*Jour. Eng. and Germ. Phil.*, Jan., 51) points out the influences of Oehlenschläger's *Aladdin* on Ibsen's drama. Turning to Björnson we find that his charming story *En Glad Gut* has been edited by G. R. Vowles. A study on *Ballad Criticism in Scandinavia and Great Britain during the 18th Century* by Sigurd B. Hustvedt forms volume ii of the American Scandinavian Foundation's publications. In the field of Old Norse, A. C. Brodeur has translated Snorri Sturluson's *Prose Edda* (*Scandinavian Classics*, v) and S. Laing has rendered the same author's *Heimskringla*, dealing with the Olaf sagas (Everyman's Library). A. Pitt-Kethley has simplified Sir G. W. Dasent's *Tales from the North* for children (Dutton). Halldor Hermannsson has treated *Icelandic Books of the Sixteenth Century* (Cornell Univ. Press). A brief notice on the "Literature of Iceland" by H. W. Dresser appeared in *Home Progress* (v., 295). Philological in character is A. M. Sturtevant's "Study of the Old Norse Word *Regin*" (*Jour. Eng. and Germ. Phil.*, April, 251) in which he traces its development and change of meaning in the various Germanic languages.

Danish.—Andersen's fairy tales never lose their charm and during the year three volumes of them have appeared, one by V. P. Windmere (Rand), and two by Mrs. E. Lucas (Dutton). In the field of the novel, *Child Andrea* by Karin Michaelis has been translated by J. N. Laurvik. In the drama, E. Björkman has translated two of Hjalmar Bergstrom's plays: *Karen Borneman*, and *Lyngaard and Co.* (Modern Drama Series). Under the title *Modern Icelandic Plays*, Mrs. H. K. Schlanche has translated two problem plays, *Eyvind of the Hills*, and *The Hraun Farm*, written by the Danish dramatist Johann Sigurjonsson but situated in Iceland. A. Kildal has given a review of recent Scandinavian books (*Nation*, April 13). Wm. J. Harvey and Chud Repplen have published a survey of Danish life, institutions and culture under the title *Denmark and the Danes* (Pott). Two Danish grammars have appeared, one by E. J. Thomas, *Danish Conversation Grammar*, the other by H. Forchthammer, *How to Learn Danish* (both issued by Stechert).

Dutch.—A Dutch history of the United States, written by A. Meyer and entitled *Geschiednis van het Amerikaansche Volk van af de ontdekking tot op Heden*, has been published by Eerdmans Sevensma Co. T. G. G. Valette's *Dutch Conversation Grammar* and his *Dutch Reader* have been published by Stechert. A brief account of "Flemish Folksongs" is to be found in the *Nation* (June, 623).

ROMANCE LANGUAGES AND LITERATURE

Benjamin P. Bourland

American Contributions.—The effects of the war in Europe continue to show themselves in the product of American scholarship in the Romance field during the year, in that there is a dearth of articles the preparation of which presupposes easy and frequent communication with the libraries of

the Old World, and a tendency, hitherto negligible in this country, to polemic writing on smaller points of interpretation. This latter may be taken to be at once a symptom of a certain sort of maturity and an indication of the difficulty of getting first-hand access to new matter. Still, there has been a fairly large publication of texts, which, though none is of first-rate importance, all have value, and there has been good work in the field of the mediæval popular tradition. There has been also not a little useful writing of criticism of the more popular kind.

On the pedagogic side, the significant fact has been the continued increase in the study of Spanish, and the willingness, here and there, to make the new interest in Latin-America sufficient cause for the development of work in South-American Spanish, sometimes at the expense of the Castilian. The published work in this special field, whatever its promise, cannot be said as yet to have furnished any great contribution to Romance scholarship. The year, take it all through, has brought neither the completion nor the beginning of any large work.

Necrology.—Francesco Novati, born at Cremona in January, 1859, died at Milan late in December, 1915. Professor in the university of Milan, president of the Academy there, co-editor with R. Renier of the *Giornale Storico della Letteratura Italiana*, and editor of the *Studi Medievali*, he was one of the most distinguished and most useful scholars in the field of Italian literature. Alfred Holder, born at Vienna on April 4, 1840, died in January, 1916, at Carlsruhe, where he was director of the Grand-Ducal Library. Among his many and multifarious writings, his *Altkeltischer Sprachschatz* (1896), and his edition of *Saxo Grammaticus* (1886) are of importance to Romance scholarship. Giuseppe Pitrè, born at Palermo on Dec. 23, 1841, died there on Aug. 10. He was the greatest authority on all branches of Sicilian folklore. Among his many writings may be mentioned the *Biblioteca delle Tradizioni Popolari Siciliane* (28 vols., Palermo, 1871-1914) and his editorship of the *Archivo per lo Studio delle Tradizioni Popolari* (23 vols., 1882-1907), and of the 16 volumes of the *Curiosità Popolari Tradizionali* (1885-1890). He fought in Palermo, with Garibaldi, in 1860. José Echegaray, born at Madrid in March, 1833, died on Sept. 15. He was distinguished as mathematician, engineer, poet, and dramatist, and served his country at different times as Minister of Finance and of Education, and as Postmàster-General. Of his many plays, written 1875-1900, the best is *El Gran Galeoto*. Auguste-Emile Faguet, of the French Academy, professor of the Faculté des Lettres at Paris, died there on June 7. He was born at La Roche-sur-Yon on Feb. 18, 1847. He was a learned and discriminating critic of French literature, and a voluminous writer for many periodicals and newspapers. His principal contributions to scholarship are contained in a series of volumes of Literary Studies on the XVI, XVII, XVIII, and XIX centuries, 1885-1900, a book entitled *Les Politiques et Moralistes du XIXe Siècle* (1899).

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ANCIENT LITERATURE AND PHILOLOGY

ANCIENT LITERATURE

(*Additions from Papyri*)

CLIFFORD HERSCHEL MOORE

Again in 1916 the chief publication of literary papyri comes from the skilled hands of the Oxford editors. The eleventh volume of the *Oxyrhynchus Papyri* is given wholly to literary and religious texts, while the twelfth volume will contain only documents.

Eleven new classical numbers in all are offered us. The list opens with parts of Hesiod's *Catalogue of Women* (1358 and 1359). In the first number one fragment deals with the story of Europa, following the tradition which made the Sarpedon of the *Iliad* the son of Europa and Zeus; the second, more fragmentary than the first, seems to contain the story of the pursuit of the Harpies by the Boreadae. The scanty remains published in 1359 apparently deal with the legends of Auge and Telephus, and of Diomedes and Hyacinthus. Among the most important discoveries are some drinking songs by Bacchylides (1361), but of the 48 fragments only two are complete enough to be intelligible. The first gives us 17 verses in praise of wine, addressed apparently to Alexander, son of King Amyntas of Macedon, to whom Pindar dedicated an ode. The other, of which 10 verses are fairly complete, is dedicated to Hiero. Internal evidence shows that it was composed later than 476 B. C., and that the poet was not in Sicily; it seems also to contain a reference to the fifth ode of the British Museum papyrus.

Considerable remains of the *Aetia* and *Iambi* of Callimachus have been published already from Oxyrhynchus. No. 1362 presents a new fragment of the former work, dealing with the association of Peleus with the island Icus, and with the ceremonies which celebrated the hero's arrival. Some new fragments of the *Iambi* (1363) are too scanty to do more than give hope for the future.

A notable addition to the early sophistic literature is made by a fragment of the treatise *On Truth* by Antiphon the Sophist (1364), a contemporary of Socrates. The theme is the antithesis between natural and human law. The writer seeks to justify furtive breaches of the law, and urges that obedience is wholly a matter of personal expediency; a little later he points out that distinctions of birth are entirely artificial.

A third century papyrus sheet (1365) contains an anonymous account of the origin and rise of Orthagoras, tyrant of Sicyon in the first half of the seventh century B. C., who has hitherto been hardly more than a name. Some pieces from the epitome of Hermippus' works *On Lawgivers, On the Seven Wise Men,* and *On Pythagoras,* made by Heracleides Lembus (1367), give the end of the first book and the beginning of the second, with a subscription attesting authorship and subject. This discovery completely disposes of certain conjectures by the learned as to the nature and scope of Heracleides' work. We have also a fragment (1368) from an unknown romance, which dealt in the usual way with the adventures of a certain Glaucetes. Finally we must name a scanty fragment of an unknown Attic orator (1366).

Students of religion will welcome Nos. 1380-82 and 1384. The first of these is a long invocation to Isis on an early second-century papyrus, which we at once compare with parts of the eleventh book of Apuleius' *Metamorphoses* and with other similar passages. The second, also of the same century, is in praise of Imouthes-Asclepius, and the third gives the end and title of a story illustrating the ἀρετή of Zeus-Helios-Sarapis. The fourth contains two fragments, apparently belonging to an uncanonical gospel or gospels, along with some medical recipes. A bit from a sailor's song (1383) completes the list of new literary texts.

Of the theological fragments, 1357 deserves especial notice. It contains a calendar of church services at Oxyrhynchus for five months of the year 535-6, which forms one of the most interesting documents concerning the early Egyptian church that has yet come to light.

Of extant classical authors some large pieces have been found, no one of which is of great textual value. But the lengthy passages from Aristophanes' comedies (1371-74) on fifth-century papyri and a long fragment of Thucydides VII (1376) are welcome. To the scanty finds of Latin works we can add a new fragment of Livy I (1379), and No. 62 of the second volume of the *Rylands Papyri*, which contains a translation into Greek from some unknown Latin work.

GREEK LITERATURE

William Arthur Heidel

The *Year's Work in Classical Studies, 1915* (John Murray), now in its tenth year, gives in the main a satisfactory review of the more important works dealing with Greek literature. The authors of the several chapters, however, like the writer, have been greatly handicapped by conditions resulting from the European War. Scarcely any publications have arrived from Germany since March, and once more the hope of presenting a general survey of the year's work is a hope deferred until better times. Meanwhile we shall continue the practice of former years in giving prominence to publications in American journals.

In the *Transactions of the American Philological Association* (1915) appear, among others, the following studies: "Hephaestion and Irrationality," by M. W. Humphreys; "The Wanderings of Dardanus and the Dardani," by G. H. Macurdy; "The ΟΔΥΣΣΗΣ of Cratinus and the *Cyclops* of Euripides," by R. H. Tanner; "Democritus' Theory of Sense Perception," by R. B. English; "Early Cyprian Greek," by George Hempl. The presidential address of Prof. E. P. Morris, "A Science of Style," deserves particular attention as a thoughtful essay in a difficult field.

In the *American Journal of Philology* (now edited jointly by Profs. B. L. Gildersleeve and C. W. E. Miller) we note the following titles: "The Latest Expansion of the *Iliad*," by G. M. Bolling; "A Point in the Interpretation of the *Antigone* of Sophocles," by Charles Knapp; "The Personality of the Epicurean Gods," by G. D. Hadzsitz; "Mimnermus and Propertius," by D. B. Durham; "ΟΠΩΣ and ΟΠΩΤΑΝ" by B. L. Gildersleeve.

In *Classical Philology* the following articles may be mentioned: ΤΥΧΗ ΠΡΟΛΟΓΙΖΟΥΣΑ and the Identification of the Speaker of the Prologue," by C. H. Moore; "The ΑΡΑΠΕΤΙΔΕΣ of Cratinus and the Eleusinian Tax Decree," by R. H. Tanner; "Assumed Contradictions in the Seasons of the *Odyssey*," by J. A. Scott; "The Lot Oracle at Delphi," by F. E. Robbins; "Narrative and Speech Scansion in Homer," by A. Shewan; "Isocrates and the Epicureans," by H. M. Hubbell; "Plutarch's *Alexander* and Arrian's *Anabasis*," by R. B. Steele.

American doctoral dissertations on Greek subjects for the year which have come to the notice of the writer are few. *Lucian's Atticism*, by R. J. Deferrari, a Princeton dissertation, is a meritorious study of style, which ought to be pursued further and should lead to interesting results. *A Study of Archaism in Euripides*, by C. A. Manning (Columbia Univ. Press), opens up an alluring field and throws new light on the art of

the dramatist. *The Platonism of Plutarch*, by Roger Miller Jones, a dissertation of the University of Chicago (Collegiate Press), is the work of an exceptionally able scholar and deserves high praise.

The books of the year are fewer than might have been expected. Here especially the war has caused a lessening of publication. The study of Greek literature ought to profit by the admirable *Greek Grammar* (for schools and colleges), by Prof. Herbert Weir Smyth, unquestionably the best brief grammar in English. The Loeb Classical Library (Putnams) continues to add to the debt we owe to Mr. Loeb and the editors. Nine volumes have appeared during the year in the Greek series. *Marcus Aurelius Antoninus*, by C. R. Haines, fully justifies the editors in bringing out a new translation; it is safe to say that many who have read the imperial sage in English only will henceforth use this charming guide to a knowledge of the Greek original. *Hesiod, the Homeric Hymns and Homerica*, by H. G. Evelyn-White, is valuable for much besides the excellent translation of the text. In the *Pindar*, by Sir. J. E. Sandys, many an admirer of the Theban bard will find his favorite text; even after the rendering of Myers, this new translation is assured of a cordial welcome. Prof. B. Perrin has added two volumes to his version of the *Lives* of Plutarch, which is the best we have, and E. Cary another volume of Dio's *Roman History*. A. J. Brock gives us a competent rendering of Galen's treatise *On the Natural Faculties*, and W. R. Paton presents the first volume of a *Greek Anthology* in a happy translation. Lovers of romance will welcome heartily the volume which contains the *Daphnis and Chloe* of Longus, translated by J. M. Edmonds, and *Parthenius*, translated by S. Gaselee.

Sir J. E. Sandys, who had given us an invaluable *History of Classical Scholarship* in three volumes (1903, 2d ed. 1906), now issues a *Short History of Classical Scholarship* (Putnams), which all friends of the classics will prize for its succinct and readable information in compendious form. *Greek Genius and Other Essays*, by John Jay Chapman (Moffat, Yard), contains an appreciative study of Euripides calculated to appeal to the general reader of good literature. *The Greek Tradition: Studies in the Reconstruction of Ancient Thought*, by J. A. K. Thomson (Macmillans), is a stimulating book, less adapted to instruct than to provoke thought. There is much which the author does not know about the subjects he discusses, but he writes as one who has lived where there is abundant intellectual stimulus and has profited by it. His book is good reading for a scholar.

Homer and History, by Walter Leaf (Macmillans), is much the most important book we have to notice. It is the work of a scholar keenly alive to the best classical study of our time and prepared by years of intelligent research to contribute to a saner thought in regard to Homer. Mr. Leaf is certainly right in dating "Homer" far earlier than many scholars have been accustomed to place him, and, questions of detail apart, he is clearly right in laying the emphasis not on minutiæ of statement but on the relation of the Homeric epics to the early history of the eastern Mediterranean basin.

Greek philosophy has little to boast of. *Socrates, Master of Life*, by W. E. Leonard (Open Court Pub. Co.), is a charming essay and, perhaps, the most satisfactory brief account we have of the great Athenian sage. *The Stoic Philosophy*, by Gilbert Murray (Putnams), a Conway lecture, is charming reading, but possesses not a single solid merit as an account of Stoicism.

Among works on archæology the student of things Greek ought not to overlook a book of prime importance, particularly to Americans, the *Handbook of the Cesnola Collection of Antiquities from Cyprus*, by John L. Myres (New York, Metropolitan Museum of Art). In view of the public neglect of the collection because of its supposed spuriousness, it is well to emphasize the fact that with trifling exceptions the antiquities contained in it are shown to be genuine. How important they may prove to be in view of the probability, even the certainty, of intimate relation of

ancient Cyprus to Minoan Crete, no one can now forecast.

Several books should be mentioned which, though not works of distinguished scholarship, will surely interest friends of Greek literature. *The Glory that was Greece*, by J. C. Stobart (Lippincott), now in its second edition, is at once one of the most readable and one of the most beautifully illustrated books about Greece that have appeared in a generation. Joseph Pennell's drawings *In the Land of Temples* (Lippincotts) catch, as only a true artist's pencil can, the very spirit of Greece, Sicily, and Magne Græcia. *Women of the Classics*, by Mary C. Sturgeon (Crowell), is a beautiful book, charmingly made and written in a style to delight the reader.

LATIN LITERATURE

CHARLES KNAPP

The second edition of *The New International Encyclopedia* (*A. Y. B.*, 1915, p. 762) was completed by the publication of volumes xvii-xxiii. The revision of the classical articles in these, as in the earlier volumes, was made by C. Knapp.

To the Loeb Classical Library (*A. Y. B.*, 1913, p. 805) several translations of Latin authors have been contributed by American scholars: of Cicero, *De Officiis*, by W. Miller; of Horace, *Odes and Epodes*, by C. E. Bennett; of Ovid, *Heroides and Amores*, by G. Showerman; of Ovid, *Metamorphoses* (two vols.), by F. J. Miller; of Suetonius, complete (two vols.), by J. C. Rolfe; of Vergil, *Eclogues*, *Georgics*, and *Aeneid*, I-VI, by H. R. Fairclough. Other important translations are, Vergil, *Eclogues and Georgics*, by T. C. Williams; and two in the University of Michigan Studies, Humanistic Series, xi, the one, *Robert of Chester's Latin Translation of the "Algebra" of Al-Khowarizmi*, by L. C. Karpinski, the other of *The Prodromus of Nicolaus Steno's Dissertation Concerning a Solid Body Enclosed by Process of Nature within a Solid Body*, by J. G. Winter. The original of the former book was made in the ninth century, the Latin version in the twelfth. On the value of the original see D. E. Smith, in *Science* (xliii, 389).

Interpreting the term literature somewhat broadly, so that it shall include all articles which will be of real service to the student of Latin literature, we proceed to give a selected list of articles, arranged according to the Latin authors with whom they deal primarily[1]: "Verbatim Reports of Augustine's Unwritten Sermons," by R. Deferrari (*TAPA.*, xlvi, 35), an argument that in Augustine's "Sermons" we possess unrevised long-hand transcriptions of short-hand verbatim reports; "By-Paths in Cæsarean Bibliography," by F. S. Dunn (*CW.*, ix, 65); "Cæsar *B. G.*, III., 12, 1—a Review and an Interpretation," by S. G. Oliphant (*AJP.*, xxxvii, 282), a defense of the manuscript text, and an interpretation of Cæsar's words as meant to apply only to the actual facts of his experience with the tides while he was fighting the Veneti, and as, in this sense, absolutely correct; "A Vexed Passage in the *Gallic War* (v, 16)," by F. G. Moore (*AJP.*, xxxvii, 206); "The International Law of the Gallic Campaigns," by M. Radin (*CJ.*, xii, 8); "A Lee Shore," by A. R. Wightman (*CW.*, ix, 130), a discussion of Cæsar, *De Bello Gallico*, IV, 28, 3; "Later Echoes of Calpurnius and Nemesianus," by W. P. Mustard (*AJP.*, xxxvii, 73); "Quintus Curtius Rufus," by R. B. Steele (*AJP.*, xxxvi, 402), an attempt to prove that Curtius wrote in the first years of the reign of Alexander Severus; "Interpretatiunculae," by E. W. Fay (*CW.*, ix, 162), a discussion of Horace, *Carmina*, II, 15, and of Vergil, *Eclogues*, V; "Horace and Valerius Cato," by G. L. Hendrickson (*CP*, xi, 249), an argument that the verses prefixed in many manuscripts to Horace, *Sermones*, I, 10, but usually rejected by scholars, were in fact written by Horace himself; "*Molle atque Facetum*," by M. B. Ogle (*AJP.*, xxxvii, 327), a refutation of the explanation advanced by C. N. Jackson (*HS.*, xxv) of the famous words of

[1] Periodicals are cited thus: *AJP., American Journal of Philology; CJ., Classical Journal; CP., Classical Philology; CQ., Classical Quarterly; CW., Classical Weekly; HS., Harvard Studies; TAPA., Transactions of the American Philological Association.*

Horace, *Sermones*, I, 10, 44; "Horace an Atticist," by M. B. Ogle (*CP.*, xi, 156), a denial that Horace was an Atticist, in opposition to the explanation of Horace, *Sermones*, I, 10, given by B. L. Ullman (*CP.*, x, 270); "The Lucretian Theory of Providence," by G. D. Hadzsits (*CW.*, ix, 146); "Criticism of the Text of Lucretius," by W. A. Merrill (*University of California Publications in Classical Philology*); "Some Features of Ovid's Style: I. Personification of Abstractions," by F. J. Miller (*CJ.*, xi, 516); "The New Critical Edition of Ovid's *Metamorphoses*," by E. K. Rand (*CP.*, xi, 46), an examination, in the main adverse, of the critical text-edition of the *Metamorphoses* published by Magnus (1914); "Petronius, Poggio, and John of Salisbury," by E. T. Sage (*CP.*, xi, 11), an argument that John of Salisbury knew all parts of Petronius, though it is not certain that he had a manuscript of Petronius; "Atticism in Petronius," by E. T. Sage (*TAPA.*, xlvi, 47); "Mimnermus and Propertius," by D. B. Durham (*AJP.*, xxxvii, 194), in opposition to the view of Wilamowitz that Mimnermus was a model for the "Cynthia" book of Propertius; "Seneca's Epigrams," by K. P. Harrington (*TAPA.*, xlvi, 207); "Notes on Tibullus," by K. F. Smith (*AJP.*, xxxvii, 131), dealing with the literary tradition of Tibullus in modern times; "An Attempt to Date the Composition of Aeneid VII," by Gertrude M. Hirst (*CQ.*, x, 87); "Is Donatus's 'Commentary on Virgil' Lost?" by E. K. Rand (*CQ.*, x, 158).

Less definitely connected with a particular author are the following: "The Clausula and the Higher Criticism," by Susan H. Ballou (*TAPA.*, xlvi, 157), a discussion of the way in which the doctrine of rhythmical clausulae in prose writings may help to decide questions of authorship; "*Fortunatus Et Ille*," by T. Frank (*CJ.*, xi, 482), an attempt to explain why the Romans, who were deeply sensitive to the beauties of nature, so seldom in literature gave expression to that sensitiveness; "The Personality of the Epicurean Gods," by G. D. Hadzsitz (*AJP.*, xxxvii, 317); "The Crooked Plow," by F. Harrison (*CJ.*, xi., 323), a criticism by a man of affairs, skilled also in farming, of scholars' descriptions of the Roman plow, and a declaration that the Romans, with a less perfect instrument than we possess, plowed well and, indeed, probably better than many do today; "Legislation against Political Clubs During the Republic," by R. W. Husband (*CW.*, x, 11, 18, 26); "On the Expulsion of Foreigners from Rome," by R. W. Husband (*CP.*, xi, 315); "Election Laws in Republican Rome," by R. W. Husband (*CJ.*, xi, 535); "Liberal Studies in Ancient Rome," by C. Knapp (*Educational Rev.*, li, 237); "The Defeat of Varus and the German Frontier Policy of Augustus," by W. A. Oldfather and H. Canter (*University of Illinois Studies in the Social Sciences*, iv), in opposition to current views which attach great importance to this defeat of the Romans (for an abstract of the paper, by W. A. Oldfather, see *CJ.*, xi, 226; for a review of it, by R. V. D. Magoffin, see *CW.*, x, 47); "The Interpretation of Roman Comedy," by H. W. Prescott (*CP.*, xi, 125), a presentation of the tendencies dominant at present in the higher criticism of Plautus and Terence, of the weakness of modern method here, and the possibility of a different point of view and safer courses of procedure; "An Analysis of the Pagan Revival of the Late Fourth Century," by D. N. Robinson (*TAPA.*, xlvi, 87); "Advertising among the Romans," by E. T. Sage (*CW.*, ix, 202); "Elision and Hiatus in Latin Prose and Verse," by E. H. Sturtevant and R. G. Kent (*TAPA.*, xlvi, 129; for an abstract of this paper, by E. H. Sturtevant, see *CJ.*, xii, 34); "The Roman *Magistri* in the Civil and Military Service of the Empire," by A. E. R. Boak (*HS.*, xxvi, 73); "The '*Magistri*' of Campania and Delos," by A. E. R. Boak (*CP.*, xi, 24); "The Cost of Living in Roman Egypt," by L. C. West (*CP.*, xi, 293).

SEMITIC PHILOLOGY AND LITERATURE

MORRIS JASTROW, JR.

The Hittites.—The European War again has interfered very seriously with the productivity of European scholarship in the field of Semitic

philology and literature, and the difficulty of obtaining German publications forces the chronicler to omit almost entirely publications of that country. Fortunately, just before the more rigorous measures of the British Government against securing importations from Germany came into force, the preliminary results of researches of Friedrich Hrozny, of the University of Vienna, on Hittite inscriptions, found some years ago at Boghaz-köi by the expedition headed by the late Hugo Winakler and now gathered in Constantinople, were given in the *Mitteilungen* of the German Oriental Society. Through the study of the Hittite words transliterated into the Babylonian Cuneiform on clay tablets found at Boghaz-köi, accompanied by translations in the Sumerian and Akkadian (the non-Semitic and Semitic speech of the Euphrates Valley), Dr. Hrozny appears to have definitely established the character of the Hittite language as Aryan. His results have been endorsed by such eminent authorities as Profs. Eduard Meyer of the University of Berlin and Harri Holma of Helsinfors University, who also has published an interesting study on these lists of Hittite words and forms. In consequence of the war, the publication of the Boghaz-köi texts in Constantinople has been delayed. The volume was practically ready for publication when the war broke out. With the advance now made through the researches of Dr. Hrozny and the former investigations of R. C. Thompson of England, and Prof. Friedrich Delitzsch of Berlin, there is every reason to look forward to a definite solution of the Hittite linguistic problem as soon as the publication shall have been placed at the disposal of scholars.

Babylonia.—L. W. King, the most distinguished and most indefatigable of English Assyriologists, has followed up his *History of Sumer and Akkad* by a *History of Babylonia* (Stokes), covering the period from the foundation of the monarchy (*c.* 2350 B. C.) down to the Persian conquest in 539 B. C. It is by far the most complete presentation of the subject that has yet been issued, and is moreover written in so attractive a style as to appeal to the general public and not merely to the specialist. In a special chapter, Mr. King has given a summary, about 70 pages, of the remarkable work of the excavations carried on on the site of the ancient city of Babylonia by the German Orient Society for the past 16 years. Accompanying the summary are illustrations of some of the finds, and a valuable series of plans of buildings, walls, tombs and gates which enables the reader to form an idea of the great city as it appeared in the days of Nebuchadnezzar. Of especially absorbing interest is the chapter on the age of Hammurapi (2123-2081 B. C.) which marks an earlier climax in the history of the city of Babylon.

Mohammedanism.—Within the field of Arabic studies in Mohammedanism there are three notable publications, two of them in English. The lectures delivered by the distinguished professor of Arabic of the University of Leyden, C. Snouck Hurgronje, in the spring of 1914 in this country, have now been published under the title *Mohammedanism* (Putnams). While in the scope of this volume Professor Hurgronje touches only upon the general features of the religion and its history, the presentation is done in such a masterly manner as to compensate for the lack of details. For those desiring a more detailed exposition, Prof. Ignatz Golziher's work on *Mohammed and Islam* issued in English translation by the Yale University Press is strongly to be recommended as an authoritative work on the subject. Professor Golziher, who has no superior as a profound student of Mohammedan theology, sets forth the results of a life-long study of Mohammedan law and Mohammedan dogmatism and Mohammedan sects in a series of chapters of fascinating interest and full of details not to be found anywhere else, at least in English form. Professor Golziher has also issued a volume in the De Goeje Foundation, established at the University of Leyden in memory of the late Professor De Goeje. As No. 3 of the publications of this Foundation there has just appeared the Arabic text of Ghazali's polemical writing aimed

against the Batiniyya Sect of Mohammedanism (*Streitschrift des Gazali gegen die Batiniyya Sekte*), with a long introduction and a detailed analysis of the contents of the work. This sect, more commonly known as the Ismaelitic, was one which advocated as its main doctrine the infallibility of the Imams as the successors of Mohammed. Ghazali, who more than any other Arabic philosopher was instrumental in establishing Mohammedan orthodoxy, subjects the doctrines of the Batiniyya to a close and rigid criticism and shows how their views are a contradiction of the teachings of Mohammed. The work was written about the year 1094 when the sect seemed to have reached the zenith of their influence.

The Old Testament.—Within the field of the Old Testament, especial mention should be made of Professor George A. Barton's *Archæology and the Bible*, by far the most complete treatment of the subject, covering indeed every phase and abundantly illustrated (114 plates). It is an indispensable handbook for all students of the Bible, by a scholar of perhaps unsurpassed authority. Of a smaller compass is P. S. Hancock's very useful *Archæology of the Holy Land*, which presents the results of excavations and archæological research in Palestine.

INDO-EUROPEAN PHILOLOGY

(*Exclusive of the Germanic Languages*)

ROLAND G. KENT

General.—W. Petersen presents (*AJP.*,[1] xxxvii, 173, 255) important studies in "The Origin of the Indo-European Nominal Stem-Suffixes"; he suggests that endings became associated with ideas suggested by the word in its entirety, and were then transferred to other words as suffixes with this significance. A. F. Bräunlich gives (*Indogermanische Forschungen*, xxxv, 237) "A Theory of the Origin of Hypotaxis." He argues that the coördinating construction became subordinating when coordination was incapable of expressing the meaning, e. g., when the main clause was negative. E. W. Fay, under the title "*Pro Domo Mea*" (*AJP.*, xxxvii, 62, 156), supports with new material his previous etymological interpretations of numerals, superlatives, compounds of *sthā*, and verb flexion. H. C. Tolman discusses the Indo-European base *gʷemē* and shows that there is no reason to posit a root *gʷā* (*PAPA.*, xlvi, xviii). C. D. Buck has an illuminating account of "Language and the Sentiment of Nationality" (*Amer. Pol. Sci. Rev.*, x, 44). H. S. Gehman discusses "Plutarch's Observation of the Superiority of Latin over Greek as a Means of Expression" (*CJ.*, xi, 237) and the detection or concealment of nationality when persons speak a foreign language (*CW.*, ix, 74, x, 35, and *PAPA.*, xlvi, xvii). R. G. Kent continues his reports of papers on Indo-European linguistics, read at meetings in the United States (*Indogermanisches Jahrbuch*, iii, 202; see *A. Y. B.*, 1915, p. 765).

Indo-Iranian.—E. W. Hopkins, in "Epic Mythology" (vol. III, Pt. 1, Sec. b of the *Grundriss der indoarischen Philologie und Altertumskunde*, Trübner, Strassburg), gives a systematic account of the mythology of the two great Sanskrit epics. M. Bloomfield has a fundamental treatment of "The Etymology and Meaning of the Sanskrit Root *Varj*" (*JAOS.*, xxxv, 273), and another "On Recurring Psychic Motifs in Hindu Fiction, and the Laugh-and-Cry Motif" (*JAOS.*, xxxvi, 54), designed to pave the way to a lexicon of such motifs. F. Edgerton has "Studies in the *Veda*" (*JAOS.*, xxxv, 240), with new interpretations of three passages in the *Chandogya Upaniṣad*, and "Sources of the Filosofy of the *Upaniṣads*" (*JAOS.*, xxxvi, 197), in which he supports the views that there is no single unified system of philosophy in the *Upaniṣads*, and that all the ideas in at least the older *Upaniṣads* are set forth or clearly foreshadowed in the older Vedic texts. H. S. Gehman demonstrates the development

[1] Periodicals are cited under the following abbreviations: *AJP., American Journal of Philology; CJ., Classical Journal; CP., Classical Philology; CW., Classical Weekly; JAOS., Journal of the American Oriental Society; PAPA., TAPA., Proceedings, Transactions of the American Philological Association.*

of the meaning of "*Adhi-brū* and *adhi-vac* in the *Veda*" (*JAOS.*, xxxvi, 213). C. J. Ogden presents "Lexicographical and Grammatical Notes on the *Svapnavāsavadatta* of Bhāsa" (*JAOS.*, xxxv, 269), his gleanings in a study preliminary to an edition of the play. T. Michelson, in "Asokan Notes" (*JAOS.*, xxxvi, 205), gives a series of critical notes on the interpretation of the "Edicts" of Asoka.

Greek.—F. Eakin, in "The Greek Article in First and Second Century Papyri" (*AJP.*, xxxvii, 333), and C. W. E. Miller, in "Note on the Use of the Article before the Genitive of the Father's Name in Greek Papyri" (*ibid.*, 341), formulate the usages of the article in the papyri, and warn against the supposition of haphazard use and also against some current formulations as to its use. H. N. Sanders gives an historical study of "AN with the Future" (*ibid.*, 42), showing that there was a reluctance to use it about 400 B. C. and then again in Lucian's time. B. L. Gildersleeve has (*ibid.*, 210) a note on "ΟΠΩΣ and ΟΠΩΣ ΑΝ." J. W. Kern deals with "ἀνά and κατά: in Composition and with Case" (Ph. D. dissertation, Johns Hopkins Univ.). L. Van Hook shows (*CJ.*, xi, 495) that "The Degradation in Meaning of Certain Greek Words Meaning 'Work'" does not prove that honest toil was looked upon by the ancient Athenian as dishonoring, though this view has been taken by some. W. Petersen argues that "Greek Pronominal Adjectives of the Type ποῖος" (*TAPA.*, xlvi, 59) start from the Indo-European genitive plural in *-oisōm*, and shows that their use to designate quality was a later development. C. D. Buck interprets (*CP.*, xi, 211) the linguistic material in "The Inscriptions of Halae" published by Miss Goldman in the *American Journal of Archæology* for 1915 (p. 438). G. Hempl (*TAPA.*, xlvi, 229) interprets as Greek two early Cyprian documents, and seeks to prove that they are intermediate in alphabet between the Minoan script of Crete and the Cyprian syllabary.

Latin.—Details in the etymology of certain Latin words are handled by F. A. Wood (*CP.*, xi, 208) and E. W. Fay (*Zeitsch. für vergleichende Sprachforschung*, xlvii, 184). E. Riedel, in "Latin Verb Forms" (*Classical Quart.*, x, 165), gives a careful argument on the development of the shorter forms of the perfect tenses (such as *audiero, nosse, dixti*). E. H. Sturtevant, in "Dissimilative Writing in Republican Latin and *UO* in Plautus" (*CP.*, xi, 202), explains certain non-phonetic writings in classical Latin as due to the persistence of older spellings which represent the pronunciation of an earlier date. Sturtevant and R. G. Kent have a joint article on "Elision and Hiatus in Latin Prose and Verse" (*TAPA.*, xlvi, 129; also in abridged form by Sturtevant, in *CJ.*, xii, 34), in which they show that "elided" final sounds were really dropped and not merely slurred in speaking, and give a history of the prevalance of elision in Latin verse. J. C. Rolfe gives a detailed account of "The Use of *Gens* and *Familia* by Suetonius" (*CP.*, x, 445), in respect to the exact meanings of the words. M. Radin presents "A Latin Vocabulary for Practical Purposes" (*CJ.*, xi, 164), containing 529 reasonably common Latin words with English derivatives.

A. J. Carnoy, in "The Importance of Special Languages in the Study of Vulgar Latin" (*TAPA.*, xlvi, 75), shows how the technical words and meanings of professions and trades passed into the general vocabulary and are reflected in the Romance languages. The discussion on the sequence of tenses (see *A. Y. B.*, 1915, p. 766) is continued by Miss Susan Fowler, Miss E. M. Tyng, and B. M. Allen, and reply made by R. G. Kent (*CW.*, ix, 193). C. Knapp discusses a misunderstood form of double question and double statement (*CW.*, x, 9 and 17). H. C. Nutting gives a psychological explanation of "*Hysteron Proteron*" (*CJ.*, xi, 298); also, under the heading "Where the Latin Grammar Fails" (*CW.*, ix, 153), he discusses the use of the moods and tenses with *cum*. Reply is made by Miss B. R. Burchett and B. L. Ullman (*ibid.*, 192), and rejoinder by Nutting (*ibid.*, x, 16).

XXXI. EDUCATION AND EDUCATIONAL INSTITUTIONS

ANNA TOLMAN SMITH

ACTIVITIES OF THE FEDERAL GOVERNMENT

Appropriations.—The specific allowances provided by the Federal Government for educational purposes for the year ending June 30, 1917, aggregate $21,920,219. The appropriations differ slightly from those of the preceding year, but there has been a marked increase in government activity in respect to this interest. The disbursement of the several funds provided by the Congress for promoting agricultural education brings the government into supervisory and stimulating relation with all the institutions benefited (see XVII, *Agriculture*). The Vocational Education bill, which carries a large fund to aid in the industrial training of the youth of the land, has passed the Senate and was favorably reported by the House Committee on Education. Although the bill failed of final action, it is quite certain that it will be passed in the final session of the Sixty-fourth Congress. It is a non-partisan measure commanding the support of all the associations, educational and industrial, in the country, and its widespread discussion has given great impetus to state activities in the same direction (see also XV, *Vocational Education*).

The Government is aiding also in the advance of business education through the activities of the Federal Trade Commission. The value of the work of this Commission has been publicly recognized by a representative of the Wharton School of Commerce, University of Phnnsylvania. This authority refers in particular to two pamphlets issued during the year by this Commission, dealing with the intricate subject of cost accounting, an extensive field of inquiry which could not well be covered by any agency of restricted scope.

The customary appropriations by Congress for educational purposes were continued for the year ending June 30, 1916. The Department of Agriculture disbursed the continuing appropriation of $2,500,000 for the colleges of agriculture and the mechanic arts, $2,718,700 for agricultural experiment stations, and $1,080,000 for agricultural coöperative extension work (see also XVII, *Agriculture*). The Department of the Interior, through the agency of the Commissioner of Indian Affairs, disbursed $4,076,136 for Indian schools and school buildings. For the current expenses of the public schools of the District of Columbia, Congress appropriated nearly $2,520,340, or half the total sum necessary for their maintenance, the District bearing the other half. The appropriations for new school buildings for the District amounted to $766,000, and for playgrounds, $24,275. Congress also appropriated $175,000 for the care and education of defective, neglected and refractory children in the District.

Schools Dependent on the Federal Government.—The annual appropriation for the Columbia Institution for the Deaf amounted to $76,000, and the appropriation for Howard University to $101,000. These institutions are under the general supervision of the Secretary of the Interior. The lump appropriation for the Military Academy at West Point amounted to $979,000; for the Naval Academy at Annapolis the amount separately reported was $465,150. There are expenditures connected with both these institutions which

are comprised under other headings. In addition to the two superior institutions, the service schools for the Army include those at posts and garrisons and other selected points, also Army service schools at Fort Leavenworth and the Army War College at Washington.

Education of Dependent Peoples.—The Federal Government is directly responsible for the education of Indian youths on the reservations and in certain non-reservation boarding schools numbering altogether about 35,000, and for the education of the children of native Alaskans. The latter are gathered in 70 widely separated schools having an enrollment of about 4,000 children, besides the extension service for adults. As a result of the training in letters and industry the natives have become self-supporting and a factor in the prosperity of the territory. The educational work in the outlying possessions is supported by local revenues under the administration of Federal officials. The American school system with its vocational features has developed great power of adaptation under the most varied conditions. (See also VIII, *Territories and Dependencies.*)

The Bureau of Education.—The appropriation for the Bureau of Education for the fiscal year 1916 remained the same as for the preceding year. For the expenses of the Bureau proper $120,000 was allowed; for the education of the natives of Alaska, under the charge of the Bureau, $200,000; for the Alaska reindeer service, $5,000; and for hospital and medical service in Alaska, $25,000. It is recognized that the appropriation for the work of the Bureau proper is not adequate to the demands now resting upon it. The year under review has seen a marked increase in the call for such services as this government agency can render, from states and cities as well as from the higher institutions of the country, and it is confidently believed that more liberal support soon will be accorded.

Auxiliary Agencies.—The appropriation for the Library of Congress for the fiscal year 1916 amounted to $662,105, and for the Carnegie or Public Library, including branch library, maintenance and miscellaneous, to $50,000; the appropriation for the Smithsonian Institute amounted to $158,630; for the National Museum, $388,512; and for the National Zoological Park, $100,000. The Children's Bureau, which has grown out of the awakened sense of public responsibility for the physical welfare of mothers and young children, received $164,640 for salaries and expenses.

The Federal Government, through the agency of the Bureau of Naturalization and the Bureau of Education, is coöperating with school authorities and private societies in the effort to instruct and Americanize illiterate adult immigrants.

Federal Legislation.—The Army Reorganization Act approved June 3, 1916, carried an amendment providing that soldiers in service shall be given an apportunity for vocational education preparatory to their return to civil life. Representatives of the National Society for the Promotion of Industrial Education supported this measure and have assisted in preparing a plan for a commission, which it has suggested, to make a study of vocational education in the Army and to draft a report on the subject. The Federal Child Labor Act approved Sept. 1, 1916, entitled "An Act to prevent interstate commerce in the products of child labor, and for other purposes," affects education since it applies to all children under the age of 14 years (see also XVI, *Labor Legislation*).

ELEMENTARY EDUCATION

General Statistics of Education.—The schools and higher institutions of the United States enrolled during the year 1916 not less than 23½ million pupils and students. The tabulation of general statistics on the following page, which pertains to the year 1914, the latest for which the details are available, shows approximately the distribution of this total among the various classes of schools and higher institutions.

GENERAL STATISTICS OF EDUCATION

Classification	Enrollment	Estimated Per Capita Cost	Estimated Total Cost
Public elementary schools	17,934,982	$27.11	$486,165,968
Public high schools	1,218,804	56.54	68,911,178
Private elementary schools	1,626,310	32.00	52,041,920
Private high schools	177,260	94.10	14,572,044
Other public and private secondary schools	85,738	157.47	13,501,163
Universities, colleges, and professional schools	283,499	335.57	95,153,894
Normal schools	95,286	158.34	15,087,585

To the total enrollment given in the table, 21,421,879, should be added 611,000 in attendance upon city evening schools, and 168,000 in private business colleges, which are also, as a rule, held in the evening. The registration in special schools of a miscellaneous character, e. g., private kindergarten, art schools, schools for defectives, wards of the nation, etc., increases the total given by about 300,000.

Including the amount for the regular schools and colleges, $745,500,000, and the cost of special schools, $294,000, the total expenditure for education in 1914 was $794,460,000. At the normal rate of increase this would raise the expenditure for the year 1916 to $800,000,000, which exceeds by $69,000,000 the total ordinary disbursements by the Federal Government as reported in 1915.

The Public School System.—The vast majority of children in the United States attend the public schools. This is true even at the high-school stage, the ratio of attendance in public high schools as compared with that in private high schools being 7 : 1. The 48 independent state systems, with the included 1,241 city systems, tend more and more to a common standard; hence they may properly be considered as forming a national system of education, which is characterized by free and equal educational opportunity for all children, by compulsory-attendance laws, and by the prescription of specific qualifications for teachers.

The following statistics show the status of the public schools in 1914, the latest year for which full details are available:

Geographical Division	Estimated Total Population, 1914.	School Population (Ages 5-18)		Enrollment in Public Schools	
		Number	Per Cent. of Total	Total	Per Cent. of School Population
United States	98,781,324	26,002,153	26.32	19,153,786	19.39
North Atlantic	27,923,470	6,544,063	23.47	4,578,126	16.40
North Central	31,403,771	8,009,822	25.50	6,139,220	19.55
South Atlantic	12,941,280	3,916,630	30.34	2,835,357	21.91
South Central	18,521,662	5,749,744	31.03	4,142,849	22.37
Western	7,991,141	1,781,894	22.13	1,458,234	18.25

Geographical Division	Average Daily Attendance		Teachers		Expenditure	
	Total	Per Cent. of Enrollment	Total	Per Cent. Male	Total	Per Capita of School Population
United States	14,216,459	74.2	580,058	19.8	$555,077,146	$21.34
North Atlantic	3,677,735	80.3	142,997	13.5	185,926,208	28.41
North Central	4,814,682	78.4	220,075	18.2	212,584,896	26.54
South Atlantic	1,906,317	67.2	69,576	23.0	36,053,519	9.21
South Central	2,696,622	65.1	96,687	31.3	51,468,803	8.95
Western	1,121,103	76.9	50,723	17.9	69,043,720	38.75

Inequality Between the Divisions of the Country.—The results of school instruction depend chiefly upon the length of the school term and the salary inducements for teachers. In these respects the differences between the different geographical divisions of the country are marked, as appears from the following averages in the year 1914:

Geographical Division	Average Number of Days in School Term, 1914	Average Monthly Salary of Teachers			Average Length of School Year, in Months	Average Annual Salary of All Teachers
		Men	Women	All		
United States	158.7	$79.94	$62.57	$66.07	7.94	$524.60
North Atlantic	181.6	103.29	72.62	76.68	9.08	696.25
North Central	165.6	79.97	61.47	64.91	8.28	537.45
South Atlantic	133.8	65.78	44.15	49.16	6.69	328.88
South Central	129.4	64.83	51.36	55.65	6.47	360.06
Western	166.2	104.54	79.86	84.24	8.31	699.03

The averages, it should be considered, conceal extremes. For example, while the average school term is 158.7 days, in five states the average exceeds 180 days, but in 21 states it falls below 160 days, and in one state is less than 120 days. These low averages are based upon both city and rural school terms. If the analysis were carried out by districts, it would be found that there are many districts in the country in which the school year does not exceed 90 days or three months. It is evident that the length of the school year is a determining factor in the actual salary paid to individual teachers.

Teachers' Salaries and Total Expenditure.—The statistics relating to salaries should, therefore, be studied in connection with the length of the school year. It will be observed that the average annual salary for teachers in the United States is $524.60, but there are eight states in the Union in which, on the annual basis, the average salary is below $350. These conditions explain the prominence given to the subject of teachers' salaries in the campaign for school improvement which is carried on in every state. The statistics show steady improvement in this respect, depending evidently upon the increased funds devoted to educational purposes. The total expenditure for public schools more than doubled in the period 1900-1914 and the increase was fairly distributed over the various geographical divisions, as may be inferred from the following per capita estimates:

Geographical Divisions	1899–1900	1909–10	1913–14
United States	$2.84	$4.64	$5.62
North Atlantic	3.99	5.53	6.66
North Central	3.27	5.52	6.77
South Atlantic	1.24	2.20	2.79
South Central	1.08	2.42	2.78
Western	4.21	7.27	8.64

In many parts of the country the need of schoolhouses of modern type has been so great that some portion of the increased resources has necessarily been diverted to that purpose. At the present time the estimated value of all public property used for school purposes is nearly 1½ billion dollars.

The agitation for increased pay for teachers is accompanied by efforts for improving their qualifications. About one-half the states whose legislatures met in 1916 amended their laws relating to teachers' certificates, the tendency being in every case to make the examinations on which the certificates are granted more rigid, and to require at least a year of special training on the part of candidates for even the lowest certificate.

State Legislation.—The education laws passed during the year show a tendency to increase state authority, having special regard to the interests of rural schools. Several states have passed laws reorganizing the state board of education, the Maryland law being peculiarly comprehensive. This measure confers upon the state Board of Education au-

thority to regulate schoolhouse construction, standardize schools, regulate the issuance of teachers' certificates, prescribe the course of study for public and normal schools, and determine the conditions for the conferring of degrees by higher institutions. Provision for the more adequate supervision of rural schools was made by the Virginia legislature, which created the office of division (equivalent to county) school superintendent and fixed minimum qualifications for the office. An act passed by the New Jersey legislature authorized the state commissioner of education to appoint a "helping teacher" to aid and direct the teachers of two or more school districts. The legislatures of several states, notably Maryland, Virginia, Kentucky, South Carolina and Mississippi, authorized increased taxation for school purposes. The act passed in Mississippi permits any rural school district to levy a tax for the purpose of supplementing the salary of the teacher or extending the school term, authorizes the provision of teachers' cottages, and permits consolidated districts to levy taxes for this special purpose.

The policy of anticipating legislation by a careful investigation of conditions was emphasized by the provision made in Mississippi, Maryland and Massachusetts for creating or continuing commissions charged with investigations of this character. The supply of free text-books was authorized by Virginia, Georgia and Mississippi. In Maryland the new law added supplementary readers and school supplies to the existing free text-book list. The passage of a compulsory school-attendance law in Georgia leaves but one state, Mississippi, without such requirement. In Louisiana and Maryland partial compulsory school laws were extended during the year to the entire states.

RURAL SCHOOLS

General Tendencies.—Of the entire population of the United States, 58 per cent. live in rural communities or small villages; hence the great importance of the recent efforts for the improvement of the rural schools. For a time the excessive emphasis upon the relation of these schools to local conditions threatened a cleavage between them and urban schools. This danger has passed in the enlarged conception of the province of elementary education. Fundamentally its requirements are the same for all communities, but they involve subordinate modifications which do not preclude unity in spirit and scope. Rural schools depend more directly upon the state authorities than do city schools, and their special needs have been recognized in all recent educational legislation.

Consolidated Schools.—The movement for consolidated schools was extended during the year. In West Virginia 375 one-teacher schools were replaced by union schools having three or more teachers. Wisconsin reports 600 graded country schools employing an average of three teachers each. New York added 100 consolidated schools to the previous number; this total includes two agricultural high schools. Missouri has at present 110 consolidated schools, of which 30 were organized during the year 1916. In Louisiana 43 were established during the year, receiving special state aid for buildings, the state contributing one dollar for every $4.34 from local funds. In Indiana 48 rural high schools have been commissioned during the year, all connected with consolidated schools. In Texas the movement is rapidly extending, about 200 consolidated schools having been formed during the year. This movement has given impetus to measures providing for the better training of rural school teachers, improved schoolhouses, and the extension of the service of medical inspection to rural districts.

Medical and Sanitary Inspection.—With regard to the medical inspection of rural schools the state commissioner of health of Pennsylvania has accomplished great results. The medical examinations under his direction extend throughout the state and in 1915 comprised 2,134 rural districts out of a total of 2,236. The results have exploded the theory that country boys and girls are of necessity sound and healthy, and have excited other states to follow the example by

similar examinations of all school children within their areas. Several states have adopted regulations for standardized school buildings in rural districts. Forty states have taken legal action as to the sanitation of school building and premises and several publish bulletins on the subject, giving full directions.

Completeness of the Rural System.—The improvement of rural schools here considered relates almost entirely to those of elementary grade, but their uplift is only one purpose of the remarkable movement which began in the South under the auspices of the Conference on Education in the South, backed by funds of the General Education Board, and was maintained until recently by coöperation with the Department of Agriculture at Washington. Two great features of the educational progress, the employment of special supervisors for rural schools and the competent staffing of secondary schools, are the result of the cooperation of the Education Board with the state school authorities. Policies thus started in the South have been extended to other sections, so that a complete system of education, comprising elementary and secondary schools and crowned by the colleges of agriculture, assures to country districts equal school facilities with those of urban areas, but related at each stage to local conditions, social and industrial.

By reference to the appropriations of the General Educational Board for the year (see *infra*), it will be observed that they include $40,500 for state agents of rural schools for whites and $33,650 for professors of secondary education, beside the large sums appropriated directly for the work of negro education.

URBAN SCHOOL SYSTEMS

Summarized Statistics.—The 1,230 cities in the United States having 5,000 population and over, comprise 1,241 school systems, 11 of the cities having dual systems. According to the last census, these cities comprised 42 per cent. of the entire population; for the latest year reported (1914) the enrollment in the city public schools was $6,889,300, or 36 per cent. of the entire enrollment for the country, the average attendance 39 per cent. of the total average attendance, and the expenditure ($340,000,000) 60 per cent. of the expenditure for all public schools. In every city the schools absorb a large proportion of the annual revenues. According to the report of the Boston Finance Commission, in that city, which is seventeenth in this respect, the ratio of school expenditure to total expenditure is 18.1 per cent., the average ratio being 20.2 per cent.

Financial Management.—Although there is little disposition in the cities to deal niggardly with the schools, there is a growing demand for wise economy in the use of the money. It is generally admitted that the financial side of this interest is not so well managed as the scholastic. The report of the Denver survey in the section on business management expresses the prevailing opinion as follows:

> The evidence points clearly to a lack of a centralized directing power, guiding all business matters and procedure in accordance with a clearly defined business policy and programme of action. . . . To realize the benefits of private management, the Board of Education must adopt the same principles, standards and organization control, with a single responsible head, that make possible the success of private undertakings.

Survey by Groups of Cities.—In the scheme of city school statistics adopted by the Federal Bureau of Education, the cities are classified in four groups on the basis of population, as shown in the following statement:

Geographical Division	Group I (100,000 and Over)	Group II (25,000 to 100,000)	Group III (10,000 to 25,000)	Group IV (5,000 to 10,000)
United States	50	185	376	630
North Atlantic	19	79	157	234
North Central.	15	59	122	225
South Atlantic	4	16	26	57
South Central.	5	19	40	69
Western.....	7	12	31	45

The group arrangement carried out for individual cities enables each city to view its problem in the light of others having similar conditions. The present consideration, however, is limited chiefly to the combined city groups, for which the general statistics are as follows:

CITY SCHOOL SYSTEMS

Geographical Division	City School Systems	Supervising Officers	Number of Teachers	Enrollment in Day Schools	Average Daily Attendance
United States	1,241	12,891	184,451	6,889,309	5,587,853
North Atlantic	489	5,691	83,915	3,141,459	2,571,764
North Central	421	4,208	58,709	2,136,078	1,762,517
South Atlantic	103	713	12,239	499,331	398,003
South Central	133	994	13,006	534,752	407,158
Western	95	1,285	16,582	577,689	448,411

Geographical Division	Pupils in Private Schools (Largely Estimated)	Total Expenses	New Buildings, Sites, Equipment, Interest and Other Indebtedness	Grand Total, Including Other Payments
United States	1,225,448	$240,943,349	$64,014,711	$340,695,026
North Atlantic	587,839	116,790,446	27,677,374	155,928,953
North Central	483,677	75,594,804	22,970,435	116,592,718
South Atlantic	30,949	11,536,213	2,788,039	15,402,089
South Central	79,259	11,989,736	2,020,894	15,684,526
Western	43,724	25,032,150	8,557,969	37,086,740

The statistics for the first three groups of cities are so far complete that they form the basis of many instructive studies; for example, it is possible to show, as in the following table, with a close approach to exactness, the proportion of pupils in the public high schools and the ratio of their cost to the total expenditure for the cities considered:

	Group I (50 cities)	Group II (180 cities)	Group III (372 cities)
Enrollment in high schools	322,658	171,170	[1] 150,129
Per cent. of total enrollment	9.5	11.7	13.8
Current expenditure for high schools	[1] $23,924,605	[1] $7,569,525	[1] $4,536,911
Per cent. of total current expenditure	17.6	15.7	14.1

[1] Incomplete.

The following table brings into comparative view certain items pertaining to the city schools which may be regarded as an index to their efficiency:

Geographical Division	Percentage of Male Teachers	Percentage of Average Attendance to Enrollment	Expenditure per Capita of Average Attendance
United States	10.40	81.11	$43.12
North Atlantic	10.18	81.87	45.41
North Central	10.24	82.51	42.89
South Atlantic	10.29	79.91	28.98
South Central	9.94	76.14	29.45
Western	12.55	77.62	55.82

Magnitude of the Work in the First City Group.—Nearly one-half the total city population of the country is comprised in the 50 cities of the first group, having each above 100,000 inhabitants. The concentration of education effort in the cities of this group is indicated by the following comparative statistics of this group and the total of urban systems:

Total cities	1,241
Total in Group I	50
Total enrollment in cities	6,889,309
Enrollment in Group I	3,396,931
Per cent. of total	49.3
Total teachers	184,451
Teachers in Group I	87,537
Per cent. of total	47.4
Total city expenditures	$340,695,026
Expenditures in Group I	$186,722,580
Per cent. of total	54.7

Vocational Demands.—The need of closer relations between school training and industrial demands is clearly seen in the larger cities where opportunities for temporary work draw young people away from school before they are fitted for any permanent occupation, and where industrial and social problems are intensified by the large foreign populations. In New York City two experiments, in what

is technically termed prevocational training, were tried on an extensive scale in 1915. The Gary system was introduced into two schools, and the Ettinger plan, which provides for a six years' elementary programme followed by two or three years with emphasis on vocational subjects, was introduced into six schools. The report of these experiments, prepared by Mr. Buckingham, chief statistician of the Board of Education, has excited wide discussion and promises to be of material aid in the formulation of plans for the general readjustment of city-school programmes.

The Immigrant Problem.—The discussion of immigrant illiteracy in the populous centers of the country has resulted in the conviction that for minors the public day school is the most efficient agent for preventing illiteracy and Americanizing young foreigners; the case of adult immigrants, on the contrary, must be met largely by night schools and in this belief the status of these schools has been the subject of special investigation during the year.

The highest percentage of foreign-born population in any one of the cities was 40.8 in New York; Boston follows with 36.3 per cent. The remaining cities having above 30 per cent. foreign-born are Chicago, Cincinnati, Detroit and Newark. The difference in the *per capita* expenditure for evening schools in these six cities is remarkable, the range being from 8 cents in Cincinnati and Boston to 44 cents in Newark.

Bureaus of Research.—The tendency toward a careful sifting of all conditions bearing upon school attendance and efficiency is illustrated by the creation in several cities of special bureaus of research and efficiency. These bureaus are in charge of experts, and the reports already issued furnish invaluable data accessible to superintendents in other cities so that contemplated changes may be made in the light of full information of experience elsewhere.

Progress in the Smaller Cities.—In the smaller cities progress is shown by the provision of new buildings with modern adaptations, the purchase of playgrounds, and rapid increase in the number of high schools. Several cities having from 10,000 to 30,000 inhabitants have recently completed high-school buildings at a cost of from $150,000 to $200,000. Hammond, Ind., has erected an industrial high school at a cost of $300,000. At Redondo Beach, Cal., a high-school building on the group plan has been erected at a cost of $150,000; an auditorium is provided, equipped with a moving-picture booth and a large pipe organ, and adapted both to school purposes and those of a civic center. The "six and six plan" has met with much favor in the smaller cities and 209 cities of this group report the establishment of junior high schools which provide for prevocational courses. A very large proportion of the smaller cities maintain vacation schools of from four to eight weeks, and two cities of this class maintained some schools throughout the year.

The expense attending special surveys by experts, such as those conducted at Cleveland (see XV, *Constructive and Preventive Social Work*) and Denver, precludes the experiment in smaller cities. The same result, however, is obtained in several states through coöperation with the state universities. The University of Kansas has undertaken a survey of 35 cities in that state, and the University of Iowa has conducted a survey of handwriting in city schools in the state. As a means of systematizing separate investigations of this kind, the National Society for the Study of Education has outlined a plan for their organization.

Pre-School Education.—The recently revived interest in pre-school training, growing largely out of the Montessori movement, has resulted in a decided increase in the number of kindergartens maintained by public school authorities. In the North Central states 82 cities have established 137 public kindergartens, of which 80 are in cities and towns where none formerly existed. California leads all states in this respect, having established 29 new kindergartens during the year, of which 25 are in places having none previously. In many cases private kindergartens, maintained by women's associations or other societies, have been taken over by the school authorities.

EDUCATION OF THE NEGRO

Public Schools.—The education of the negro is a matter of vital interest to the nation because of its bearing upon the industrial efficiency of the southern states and upon the social welfare of all cities having a large proportion of negro residents. Public schools offer the readiest means not only of elevating the negro but of ascertaining the living conditions of the colored race and of correcting such as are a menace to themselves and to the country.

In 17 southern states and the District of Columbia the school population numbers 10½ millions, of which nearly one-third belongs to the negro race. The following statistics bring into comparative view the status of the two races in respect to school provision in 1914:

	White	Negro
Enrollment in state common schools	5,789,371	1,895,199
Per cent. of school population	79.27	58.43
Average daily attendance	3,912,553	1,205,619
Per cent. of enrollment	67.58	63.61
Number of teachers	151,369	34,334
Number of enrolled pupils to a teacher	38	55

It is impossible to form a clear idea of the difficulties against which the schools for the colored race have to contend so long as the resources available for them are included in the lump sum with those applied to the white schools. It is well known that their expenditure falls below that for white schools in the same communities, and this fact partly explains the lower averages in respect to all financial particulars for the southern states as compared with other sections of the Union. The growth of public high schools for the negroes is shown by the following:

	Schools	Teachers	Students
1910	141	473	8,251
1911	150	513	9,641
1912	159	597	10,877
1913	156	566	10,594
1914	161	638	11,770
1915	164	670	12,967

In 1915 these schools had 2,886 students in manual training, 363 in training courses for teachers, 1,870 in agricultural courses, and 4,496 in courses in domestic economy.

Training of Teachers.—The county training schools for colored teachers in the South, which numbered three in 1912-13, have now reached a total of 44. These schools are supported by the county, the Slater Fund, and the General Education Board, and are under the supervision of the public authorities. The training at present is limited, in the main, to the elementary branches and industries; secondary work is taken up as circumstances permit. The chief object of the schools is to train teachers in the county where they live and will probably teach.

State Supervisors.—During the year the states of Louisiana and Mississippi have appointed state supervisors of rural colored schools, making a total of eight states in the South having such provision. These supervisors are young southern white men, selected by the state boards of education and paid in part by the General Education Board. Their influence is manifest in the better buildings, better discipline and general improvement of the schools. The state supervisors and the county training schools are the outcome of coöperation between the school authorities and northern agencies.

Private Schools and Higher State Schools.—The efforts made by philanthropic people and the large contributions of money for the establishment and maintenance of schools for the negro race form one of the most impressive chapters in the educational history of this country. A systematic effort is in progress at the present time to eliminate the weak schools of this private class and strengthen the efficient. The sources of support for these institutions are in the main private contributions and denominational funds. They include, as a rule, elementary, secondary, and higher departments, and belong, therefore, in the same class with state institutions that continue studies beyond the high-school grade. The total number of private and state schools here referred to is 220; they employed, in 1915, 2,871 teachers and enrolled 51,006 pupils, in-

cluding 29,410 in elementary grades. In the advanced departments there were 18,000 students pursuing high-school courses, generally combined with training courses for teachers, and 3,596 students of college grade. Industrial education is emphasized in all schools of this class, and the number of pupils having the benefits of this practical training steadily increases. Reports from 158 of the institutions give total receipts for the year amounting to $2,897,243, including $735,170 appropriations for 16 state schools and Howard University at Washington, D. C. The property valuation for 194 of these schools is very nearly 15½ million dollars.

SECONDARY EDUCATION

Increased Provision.—The most significant fact in the current record of education is the steady increase in the number of high schools. The progress since 1910 is as follows:

	Public High Schools		Private High Schools	
	1910	1915	1910	1915
Number	10,213	11,674	1,781	2,248
Teachers	41,667	62,519	11,146	14,026
Pupils	915,061	1,328,984	117,400	155,044

Considering pupils only, the increase during the period for public high schools is 45.2 per cent., and for private high schools 32 per cent. In the earlier year the public high schools claimed 78.9 per cent. of all the teachers and 88.6 per cent. of the pupils; in the later year their proportion of teachers had risen to 81.6 per cent. and of the pupils to 89.5 per cent. The increase in public high schools has been quite uniform throughout the country and is even more marked in rural communities and small cities than in the larger cities.

Statistics of High Schools.—The distribution of the high schools by geographical divisions in 1915 was as follows:

Geographical Division	Public High Schools					Private High Schools				
	Number	Teachers	Students			Number	Teachers	Students		
			Boys	Girls	Total			Boys	Girls	Total
United States	11,674	62,519	601,444	727,540	1,328,984	2,248	14,026	73,208	81,836	155,044
North Atlantic	2,288	17,233	191,507	219,237	410,744	703	5,400	28,673	28,597	57,270
North Central	5,282	26,177	238,615	292,532	531,147	623	3,622	16,908	23,589	40,497
South Atlantic	1,287	4,587	39,898	52,316	92,214	336	1,838	10,546	10,342	20,888
South Central	1,738	6,601	59,523	78,432	137,955	372	1,793	11,170	10,749	21,919
Western	1,079	7,921	71,901	85,023	156,924	214	1,373	5,911	8,559	14,470

Control of Private High Schools.—More than two-thirds of the private high schools, having an enrollment of 104,000 students, are under the control of religious denominations. The Roman Catholic schools of this class number 975, with 5,154 instructors and 56,182 students. The denominations reporting more than 5,000 students in the schools under their control are the Baptist with 7,539 students; Episcopal, 6,389 students; Methodist, 6,567 students. Altogether 29 different denominations are represented, with students in the schools under their control ranging in number from 19 in a school of the People's Mission to 4,765 in schools controlled by the Latter Day Saints.

Coeducation.—With very few exceptions the public high schools are coeducational, only a little more than six per cent. of their pupils being in schools for one sex exclusively. On the contrary, more than half the pupils in private high schools attend separate schools. These include 451 schools for boys with 39,543 students, and 799 schools for girls with 46,945 students.

Income and Property.—It is impossible to present exactly the financial resources or property valuation of public high schools, as these particulars are often included with the entire state systems. As a rule, the public schools of this class are liberally supported. The total income

for 3,905 schools reporting the item amounts to 24½ million dollars, of which above 90 per cent. was from public appropriations. The grounds and buildings reported for 11,159 public high schools have a value of 407½ millions, and the value of scientific apparatus for 10,471 schools, 28¼ million dollars. The corresponding items for private high schools are as follows: 1,046 schools, amount of income, 12 million dollars, of which above 60 per cent. is derived from tuition fees; the grounds and buildings of 1,438 schools are valued at $124,300,000, and the scientific apparatus of 1,326 schools at about $8,000,000.

Duration of Secondary Course.—The question of the equivalence of American and foreign secondary schools is one of international importance and causes constant inquiry as to the curricula of the former. In comparisons in this matter the programme of the four-year high schools is taken as typical. It cannot be claimed that this is equivalent to the eight or nine years of the European secondary schools, but since the latter take the pupils at 12 years of age, the difference furnishes a strong argument for limiting the usual period of elementary study in the United States to six years and thus lowering by two years the entrance age to the high-school course. Under the designation of the "six and six plan" this change is taking place all over the country.

At present, of the entire number of public high schools, 8,440 with 56,870 teachers and 1,236,099 students are full four-years schools. Their students comprise 93 per cent. of all in public secondary schools, as against 88 per cent. in 1910. It will be seen, therefore, that the movement for junior high schools is limited.

The proportion of students completing the high-school course continues to increase from year to year. In 1915 the fourth-year students numbered 212,981, or 14.43 per cent. of the total enrollment in all secondary schools, against 12.25 per cent. in 1907.

Subjects of Instruction.—The varied purposes which the high schools serve are indicated by the distribution of students by courses of instruction as here given:

Course	Public High Schools		Private High Schools	
	Number Reporting	Students	Number Reporting	Students
Academic	11,635	1,044,200	2,248	136,264
Commercial	2,863	208,605	762	17,706
Technical or Manual Training	2,809	139,731	204	5,644
Training for Teachers	1,189	25,721	292	5,952
Agricultural	4,665	90,708	253	4,440
Domestic Economy	3,488	160,575	511	11,507

The greatest increase in the number of students, as compared with the previous year, is in the academic courses, which in the case of public high schools gained 161,000 students. The domestic economy and agricultural courses follow with gains, respectively, of 85,000 and 58,000.

Trend of Studies.—Among recent efforts to disclose the trend of secondary education in this country is an investigation made by the Bureau of Education, resulting in a comparative view of the proportion of students in typical studies at intervals of five years, from 1890 to 1915. Considering the entire period, the change in Latin for public schools has been from 34.69 per cent. to 37.32 per cent., and the change in Greek from 3.05 to 0.29 per cent. For private schools the corresponding change has been for Latin from 31.32 to 54.94 per cent., and for Greek from 7.02 to 5.82 per cent. The movement in languages for the last decade, expressed in percentage of students pursuing each, is as follows:

	Public High Schools		Private High Schools	
	1905	1915	1905	1915
Latin	50.21	37.32	46.47	54.94
Greek	1.47	.29	6.67	5.82
French	9.14	8.80	25.79	26.74
German	20.25	24.39	20.89	22.33
Spanish	.....	2.39	.....	2.71

The movement as regards language study is not very marked excepting in the case of Greek. With regard to other studies, the comparison shows that the exact sciences, chemistry, and physics, have slightly declined while the biological sciences have increased. It is of interest also to notice that rhetoric, which was studied by 48½ per cent. of pupils in 1905, increased in 1910 to 58½ per cent., and English literature from 49.3 to 55.8 per cent.

It is a matter of consequence that so large a proportion of high-school pupils take the academic course since, as a rule, this indicates the intention of going on to higher institutions. The extent of this purpose is indicated by these data for 1914:

Geographical Division	Public School Graduates		Private School Graduates	
	Total	Per Cent. Prepared for College	Total	Per Cent. Prepared for College
United States	176,056	38.85	22,285	42.59
North Atlantic	51,050	27.96	9,306	46.15
North Central	78,516	35.64	6,072	33.17
South Atlantic	11,651	44.93	2,635	46.19
South Central	15,735	45.09	2,458	49.31
Western	19,104	44.66	1,814	36.55

Above 200 county and township high schools have been established in western and southern states during the year, all making provision for studies relating to rural industries. New Hampshire has a well devised system of vocational studies for high schools which is followed by above 90 schools having full four-years courses.

Vocational Education.—Vocational education has passed the stage of tentative experiment and has found assured place in state and city systems of public instruction. It remains to extend its adoption throughout the country and to secure for it adequate support. The educational associations, labor unions, and women's clubs are all united in furthering this cause, and their efforts are heartily seconded by the Chamber of Commerce of the United States of America. Councils as to the best means of carrying on this department of education are assuming more and more definite direction, largely as a result of vocational surveys such as that carried on within the last few years in Cleveland and Richmond, and during 1916 in Minneapolis and Denver. The first vocational survey of an entire state was undertaken during the year by the Indiana State Board of Education, which committed the task to a special committee. This body included representatives of the state Board of Education and of the city systems in the state, the state University and the National Society for the Promotion of Industrial Education; the immediate direction of the survey was entrusted to C. H. Winslow, formerly of the U. S. Bureau of Labor Statistics.

The conviction prevails that day continuation schools with compulsory attendance for young employees must be included in systems of public instruction. In 10 states legal provision has been made for the maintenance of vocational classes or schools, and state aid is extended to communities carrying out the provision. The legislature of Wisconsin has taken very advanced ground in this respect, the apprenticeship law passed in 1915 requiring part-time school attendance of apprentices under contract up to 18 years of age. Massachusetts leads in the number of vocational schools, the report for 1915 giving 77 state-aided vocational schools in 39 cities and towns, showing an increase of 47 schools, representing 36 cities and towns, over the preceding year. The total cost to the municipalities and the state for these schools was $689,870. The total enrollment in state-aided schools of this kind was 18,322, and the enrollment in other vocational schools of the state brought the total up to

28,982. The legislature of New Jersey appropriated $60,000 for the year beginning Nov. 1, 1916, to carry out the provisions of the law pertaining to vocational schools. Important experiments in organizing county vocational schools are reported from this state.

At Menomonie, Wis., a coöperative arrangement has been made between the public schools and Stout Institute by which 16 lines of vocational work are offered to boys in the seventh and eighth grades and first two years of the public high schools. This experiment illustrates the possibility of offering a variety of practical activities to the pupils of public schools without large additional expense. Several notable benefactions also have been made during the year for the purpose of establishing vocational schools either under the direction of the local school board or an independent board. In Scranton, Pa., a bequest of above $400,000 has just become available for establishing a manual training school for boys and girls, and Portland, Ore., received a gift of $100,000 from a private estate for a similar purpose.

The vocational surveys to which reference has been made include a study of opportunities, which is an important factor in the whole problem of vocational education. Committees and societies of vocational guidance have been formed in connection with many public school systems, and also in colleges and universities. During the year the Board of Education of Chicago assumed charge of the Vocation Bureau which had been maintained by the Chicago Federation of Women's Clubs. In Pennsylvania plans have been perfected for extensive coöperation in dealing with the problem of juvenile employment in that state. Under this plan applications for work received from boys or girls between the ages of 14 to 18 years will be referred to the vocational-education division of the public schools. (See also XV, *Vocational Education.*)

Physical Training and Military Drill.—The subject of physical training and military drill has excited wide discussion during the year, which has led in Louisiana to an act providing for instruction in military science for boys in high schools when practicable, and in New York to the passage of a comprehensive act providing for physical training in the schools and for military training outside of the schools. In accordance with this measure:

> All pupils above the age of eight years in all elementary and secondary schools shall receive as part of the prescribed courses of instruction such physical training as the regents, after conference with the military-training commission, may determine during periods which shall average at least 20 minutes in each school day. . . . All boys above the age of 16 years and not over 19 years (except boys exempted by the commission) shall be given such military training as the commission may prescribe for periods aggregating not more than three hours in each week during the school or college year.

An inquiry as to schools having military drill for the last two years yielded the following results:

	1914		1915	
	Public	Private	Public	Private
Number of schools....	75	86	119	113
Number of boys in drill	8,702	6,835	14,481	8,836
Per cent. of total boys.	51.8	97.00	52.8	95.3

TRAINING OF TEACHERS

Progress.—The provision for training teachers has been greatly increased during the past five years, as appears from the following comparison between 1911 and 1915:

	Public Institutions		Private Institutions	
	1911	1915	1911	1915
Number....	1,060	1,484	323	584
Students....	100,785	137,094	12,329	30,735

The ratio of increase in the number of students during the period is 36 per cent. for public institutions and 149 per cent. for private institutions.

Agencies of Instruction.—The different classes of institutions engaged in the work of training teachers and the distribution of students among them in the year 1915 were as follows:

	Institutions	Students
Public normal schools.	232	94,300
Private normal schools	41	6,025
Public universities....	63	17,073
Private universities...	251	18,758
Public high schools....	1,189	25,721
Private high schools...	292	5,952
Grand total.....	2,068	167,829

The Graduates and the Demand.—The total graduates in 1915 numbered 21,944. The appropriations for public normal schools amounted in 1910-11 to $6,368,761 for support and $1,718,990 for buildings; the corresponding amounts for 1915 were $10,726,459 and $1,957,199. The striking fact in the recent record of this work is the establishment of training courses in the high schools and the increase in the number of universities and colleges engaged in the work. Notwithstanding this progress the supply of trained teachers falls far short of the needs of the country, the deficiency being specially marked in the rural schools. It is estimated that there are 212,000 one-teacher rural schools in the United States and that at least 70,000 of these are in charge of teachers who have had only an elementary education and no professional training. Unfortunately, even if the provision for the training of teachers was sufficient to meet the needs of the entire country, the low salaries and living conditions in many rural districts would keep qualified teachers away from the schools.

The Summer Schools.—It should be noted in this connection that the summer schools which are maintained by leading universities, colleges, and normal schools, have become largely centers for increasing the professional qualifications of teachers. Usually, however, they attract those who are already in the service. The number of such schools reported in 1915 was 674, with a registration of 241,811 students, of whom 86,581 were men. The estimated cost of 564 of these schools was $3,404,522. The average length of session was a little above seven weeks and many of the ablest professors of the country were engaged as instructors.

Current Discussion.—The changes in the classification and programmes of public schools which are taking place throughout the country demand new methods and purposes in the professional preparation of teachers. The subject has been prominent in all educational discussions of the year. On the one side are the extreme advocates of vocational subjects, and on the other, those who insist upon sound fundamental training. A notable contribution to the discussion has been made by a report of the Wisconsin county training schools for teachers in rural schools published as a bulletin of the Bureau of Education. The purely cultural elements of the older programmes are eliminated from these schools. Community service and vocational training are emphasized in their relation to rural communities. The value of the report is enhanced by opinions on the part of superintendents in the state who have had the opportunity of judging of the abilities of the teachers thus far graduated from the county training schools.

HIGHER EDUCATION

Statistics.—Higher education in the United States is the province of universities, colleges, and technical schools, representing, as the designations indicate, differences in scope and purpose, but possessing, in common, the authority to confer degrees. Each year sees, also, a closer approach to equality in entrance requirements and a steady increase in the number of states requiring proof of adequate equipment in teaching force and available resources on the part of institutions seeking a college charter.

For the year ending June, 1915, the number of institutions reporting under the head of higher was 563. The total registration of students in the collegiate and resident graduate departments was 237,168, which exceeded by 20,675 the corresponding number for the previous year. Special students (40,394) and students in professional departments (39,903) raised the total given above to 317,-

465 students in the departments recognized as higher. All indications point to a large increase of students in the report for 1916, partly as a result of the European War, which has retained or sent here students who under normal circumstances would have repaired to Europe.

The distribution of the higher institutions, professors and students, by the geographical divisions of the country, is as follows:

Geographical Division	Institutions	Professors and Instructors					Students			
		Preparatory Departments	Collegiate Departments	Professional Departments	Total (excluding duplicates)		Preparatory Departments		Total (excluding duplicates)	
					Men	Women	Men	Women	Men	Women
United States	563	3,626	21,653	7,426	26,636	5,931	31,596	16,444	232,572	124,917
North Atlantic	118	675	7,489	2,470	9,099	1,444	8,897	2,609	76,535	28,761
North Central	213	1,729	7,534	2,622	9,518	2,411	13,055	6,247	87,588	56,436
South Atlantic	97	543	2,178	808	2,635	761	3,658	2,967	23,854	11,882
South Central	86	433	2,053	877	2,614	801	4,025	3,941	23,460	14,632
Western	49	246	2,399	649	2,770	514	1,961	680	21,135	13,206

As indicated in the table, the preparatory and professional departments of higher institutions are provided with separate professors or instructors and hence do not, as a rule, draw from the teaching force of the collegiate departments. The distribution of students other than preparatory, who do not come within the present consideration, is as follows:

	Men	Women	Total
Collegiate	141,836	79,763	221,599
Graduate	10,471	5,098	15,569
Professional	38,128	1,775	39,903
Total	190,435	86,636	277,071
Special[1]	15,515	24,879	40,394
Total[2]	205,950	111,515	317,465

[1] Includes students in music, oratory, business courses, etc., not entered for a degree.
[2] Includes duplicates.

The income of higher institutions offers striking proof of their appreciation throughout the country. Comparison in this respect for a period of years must necessarily be limited to permanent sources of income. The amount under this head for the year under review was $66,555,207, an increase of about 3½ million over the corresponding amount for the previous year. The total considered was derived as follows: From state and municipal appropriations, 37.1 per cent.; income from invested funds, 27.4 per cent.; from tuition fees and other educational services, 35.5 per cent. As will be shown presently, the income from these sources was but little more than half the total receipts of the higher institutions for the year. Many of the remaining sources, however, are special or ephemeral and therefore do not form a basis for indicating steady growth.

PROPERTY AND INCOME OF HIGHER INSTITUTIONS

Geographical Division	Value of library, scientific apparatus, machinery, and furniture	Value of grounds	Value of buildings (including dormitories)	Productive funds	Receipts (all sources)	
					Total, exclusive of additions to endowments	Total, including endowments
United States	$75,194,504	$86,271,597	$292,698,592	$393,366,407	$107,530,226	$118,299,296
North Atlantic	25,515,780	28,658,470	120,058,305	193,912,267	38,360,736	44,228,537
North Central	27,499,712	30,210,491	87,246,926	97,451,841	39,424,304	41,852,302
South Atlantic	7,047,698	11,867,973	37,202,316	22,092,420	10,066,389	11,625,997
South Central	6,211,389	8,948,857	22,830,816	33,288,759	8,703,026	8,896,245
Western	8,919,925	6,585,806	25,360,229	46,621,120	10,975,771	11,696,215

Coeducation.—The extent to which coeducation prevails in the higher institutions is indicated by the following tabulation:

	Undergraduates
Colleges for men only	40,905
Colleges for women only	19,179
Coeducational Colleges:	
Men	100,931
Women	60,584
Total	221,599

As compared with the corresponding figures for 1910-11, there has been an increase of 49 per cent. in the number of men attending coeducational colleges, and an increase of 43 per cent. in the corresponding number of women. The increase under both considerations is much greater than that in the number of students in colleges exclusively for men or for women.

Control.—Of the total institutions reporting under the head of higher education, 95 are controlled by states or municipalities and 468 by private corporations. The former registered 96,797 undergraduate and graduate students, or nearly 50 per cent. of the total of the two classes. Seven of the number are municipal institutions which by their recent activities have brought into being an Association of Urban Universities. As a result of the emphasis thus placed upon the importance of the peculiar problems of cities in relation to the higher education, several universities of large scope, but identified in great measure by their patronage and sources of support with the cities in which they are respectively located, have come into the same organization.

The drift of students toward the largest universities is determined by their location as well as by their prestige and resources. It is noticeable, however, that colleges which confine themselves to undergraduate work attract fully 50 per cent. of the students of that class; on the other hand, of graduate students the great majority, 60 per cent., are registered in 19 universities, which, with two exceptions, report receipts above 1¼ million dollars, the range being from $1,235,891 (Leland Stanford, Jr.) to $4,334,540 (Columbia). The two exceptions noted are the University of Iowa and New York University, each of which comes very near the million limit. These figures illustrate a movement toward the relegation of graduate students to centers offering great facilities for mature students fully prepared for the higher orders of research.

Benefactions.—The aggregate of gifts and bequests, excluding grants by the United States, different states, and municipalities, reported for the year 1914-15, was $20,310,124, or 64 per cent. of all educational benefactions for the year. Of this amount, $5,984,635 was for increase of plant, $3,556,419 for current expenses, and $10,769,070 for endowment. Thirty-five universities, colleges and technological schools reported gifts above $100,000 received during 1914-15, amounting to $14,935,799. The following institutions received above one million each in benefactions: University of Chicago, Johns Hopkins University, Harvard University, Wellesley College, and the University of Pennsylvania. Yale University followed with $965,791, and the Massachusetts Institute of Technology and Princeton each secured very nearly $800,000. The state universities seldom receive large benefactions, but their appropriations from the states suffice to make up for this lack.

Colleges of Agriculture and the Mechanic Arts.—Colleges of agriculture and the mechanic arts endowed by the Land Grant Act of 1862 are included in the general statistics of higher institutions. They deserve, however, special mention because of their relation to the Federal Government and the important part which they have taken in promoting the industrial development of the country. The number of these institutions is 69, of which 52 are exclusively for white students and 17 exclusively for colored students. The former registered in 1915, 114,905 students, and the latter 10,170 students. The increasing attention to the special subjects for which they were originally intended is indicated by the growing proportion of students in various branches of agriculture and engineering. In 1915 they numbered 43,960 in the colleges for white students, an increase since

1911 of 34 per cent. In the colleges for the colored race all the students are registered in practical courses.

The income of this class of institutions for 1915 was $31,961,765, of which 11 per cent. was derived from the Federal Government, 56 per cent. from state appropriations, and 33 per cent. from private sources. The special work of these institutions has been greatly stimulated by the appropriations for agricultural experiment stations and extension work, the income of which in 1915 reached a total of $4,065,000 (see also XVII, *Agriculture*). Recent estimates of the value of the original endowment by the act of 1862 show that permanent funds amounting to $14,493,441 have been created by the sale of allotted lands. There remain unsold 1,090,294 acres.

The year 1916 has been marked by the elimination of preparatory work from several of the institutions and increased facilities for the scientific subjects and experimental work pertaining to their specialties.

The interests of the agricultural colleges and the extension service were the main subjects of consideration in the annual meeting of the Association of Agricultural Colleges and Experiment Stations held in Washington on Nov. 15. The means of extending the knowledge of scientific agriculture and the results of efforts in this direction were set forth in a most interesting manner in the conference of the county agent leaders also held in Washington in November. (See also XVII, *Agriculture.*)

Surveys.—The year has not been marked by any striking event in the province of higher education, but in review its record assumes unusual significance. The fact that state institutions are a public trust has been emphasized recently by the call for survey, of those maintained in Iowa, North Dakota, Oregon and Washington. These surveys, completed during the year, have been conducted with entire impartiality under the auspices of the Bureau of Education and by representative committees intent only upon the solution of difficult problems. In each case the intensive study of the institutions concerned has been preceded by a broad investigation of the respective states, their crude resources, their industries, and their population and its distribution. The nature of the demand having thus been ascertained, it seems possible to determine how far duplication of purposes and courses of instruction would be desirable in a state, and the points at which special facilities should be concentrated. The surveys necessarily differ in detail, but they yield certain principles of administration which may regulate state activities, generally, in the realm of higher education.

The report of the survey of the state-supported higher institutions of Iowa is particularly instructive in respect to duplication of institutions and subjects of instruction, a matter which was pressed for consideration in the call for the survey. The pith of the conclusion of this report is comprised in the recommendation of "major and service lines" of work at the three state institutions. To illustrate, agriculture would be a major line at the land-grant college, and English, as essential to the proper cultivation of the major, would belong to the service line. The suggestion is valuable but demands wise application. The chapter in the Iowa report, covering the results of a highly technical examination of selected buildings at the three state institutions with the purpose of determining the means of avoiding structural waste, is valuable as a model of method in the solution of a difficult problem.

The survey of the state institutions of Washington, including as it did three normal schools, necessarily extended in some measure to the entire system of public instruction and thus emphasized not only the principle of unity, but also the responsibility that rests upon higher institutions as directive forces in popular education. From this point of view the standards set forth in the report for a graded system of teacher preparation, and the call for a revision of the course of study for common schools, having in view the distinctive conditions of urban and rural communities, form a constructive contribution

to the widespread discussion of these two subjects.

The economic motive underlying many recent investigations is indicated by the report of an intensive study on the part of a committee appointed to examine the matter of costs in the College of the City of New York. A fact which stands out in clear relief in the report of this committee is the difficulty of securing reliable data showing the distribution of expense in higher institutions between teaching, administration, and the varied activities which make up what is termed "operation." For this reason the report of this committee, which is precise and exhaustive as regards the institution surveyed, will long serve as a guide and a source of helpful suggestions for other institutions of its class.

In addition to the *ex cathedra* surveys, several institutions have followed the early example of Oberlin by intensive investigations of their own operations either considered as a whole or by special features. Smith College, for example, completed during the year an investigation of the actual work of students and instructors which will aid in desirable readjustments. Miami University has made an intensive study of its administrative activities. The surveys, whether by external or institutional committees, afford a large body of precise information which forms a basis for what may be termed scientific knowledge of higher institutions, as contrasted with speculative theories and judgments. The effect of such exact knowledge is already seen in the tendency of institutions lacking the resources necessary for the more pretentious work to accept an inferior classification, or to merge their resources with those of other small colleges. Changes of this kind react favorably upon the movement for increasing public high schools, which is hindered where an excess of small colleges exists.

Entrance Requirements. — Apart from the surveys, the salient events of the year pertaining to higher education relate to the subjects of entrance requirements and academic freedom. The admission of students to universities by certificate from accredited high schools, a policy long established in the Middle West, has brought about a change in the practice of the eastern states which may be regarded as a modification of the certificate plan. The modified plan, which combines the certificate and examination methods of admission, was adopted by Harvard in 1911 and by Princeton, Yale, and several other institutions in 1915. It was endorsed by the National Conference Committee on Standards of Colleges and Secondary Schools, and later the College Entrance Examination Board decided to offer a set of comprehensive examinations, adapted to the use of the colleges represented in the Board, which should propose to offer comprehensive examinations for admission purposes. This decision went into effect in June, 1916, at which time the universities above mentioned availed themselves of the service. The papers of the Examining Board will be prepared by committees representing the universities concerned and also secondary schools; and will thus have the advantage of embodying varied opinions, thereby meeting a wider range of preparatory training. It also enables the university to have the advantage of a much wider distribution of its examination papers. For example, the places which Harvard has reached by this arrangement are four times as many as those to which its separate examination papers were formerly sent. The adoption of this plan indicates the disposition of the higher institutions concerned to make all reasonable concessions to the secondary schools of the country. The new method of college admission adopted during the year by Mount Holyoke, Smith, Vassar and Wellesley, to go into effect in 1919, is the same in general plan as that outlined above.

It is interesting to note that the New Hampshire College, as announced in its current catalogue, has arranged to admit without examination graduates of high schools or academies of New Hampshire which are approved by the state Department of Public Instruction, provided the preparatory training meets the division entrance requirements of the college. This action accords with the general opinion

of state superintendents in New England that the high schools should have more freedom in adapting their curricula to practical local needs.

In those sections of the country in which the standard of admission to higher institutions has been noticeably low there is a general tendency to increase the requirements. For example, the South Carolina Association of Colleges in its meeting of April, 1915, adopted a minimum standard of college admission to take effect in 1916. In several states in which the certificate plan has long prevailed, measures have been taken to raise the number of "units" required for certification, or to insure a higher content for each unit.

Academic Freedom.—The cause of academic freedom has been signally advanced during the year by the action of the board of trustees of the University of Pennsylvania and that of the directors of Bryn Mawr College. The action in the former case is one effect of the termination of the tenure of Prof. Scott Nearing which excited much discussion in 1915 (*A. Y. B.*, 1915, p. 786). The trustees of the University on Dec. 21, 1915, adopted statutes which preclude hereafter the summary dismissal of a professor. His right to a hearing in his own case is assured by the following provision:

> A professor or an assistant professor shall be removed by the board of trustees only after a conference between a committee, consisting of one representative from each of the faculties in the university (such representative being chosen by the faculty of which the representative is a member), and a committee of equal number from the board of trustees, at which conference the provost shall preside, and upon a report from such conference to the board of trustees for consideration and action by them.

The action of the directors of Bryn Mawr College was the climax of discussions growing out of the alleged arbitrary authority of the president of the college, Dr. M. Carey Thomas, who finally suggested the appointment of a special committee to decide upon a new administrative policy. The plan recommended by this committee and adopted by the directors provides for the representation of the faculty on the board of directors, for their coöperation through a standing committee in the choice and appointment of professors, and for impartial judgments in the case of the proposed removal of a professor or associate professor with opportunity for a full hearing of the case on his own part.

Curricula.—The latest extensions of university curricula are in the direction of expert accountancy and efficient civic administration. To a degree the former subject merges into the latter, but it had earlier and independent recognition and has a sufficient content of its own. The American Political Science Association started the movement in this direction some years ago, and new impetus was given by the National Conference on Universities and Public Service held in New York in the spring of 1914 (*A. Y. B.*, 1914, p. 234).

During 1916 a Society for the Promotion of Training for Public Service was formed and abundant material for its consideration has been supplied by the reports of two special committees. The first of these committees, appointed by President Butler of Columbia University, has offered a programme for what is termed adequate training "for unofficial public service and non-technical administrative positions." The subjects of the programme are not entirely new, but they are brought together in a new relation and provision is made for practical field work and observation under expert direction such as that of the New York Bureau of Municipal Research.

The second committee was appointed by President Mezes of the College of the City of New York to draw up plans for a new department of the College to be under a director of public-service training. This department would contain an intelligence office or clearing house for civil-service positions, maintained in the interests of the students, institute a service of exchange of students, instructors, and credits between the College and the training school for public service and the Bureau of Municipal Research, and also advise as to the special courses of instruction that will fit the students for careers in the public service.

Plans for the new type of university extension provided for by the Massachusetts legislature are still in a tentative stage. They embody the latest tendencies in the extension work of the older universities, which are tersely expressed as "state service." The value of university extension and the conditions of fruitful graduate work were the chief subjects of deliberation in the annual meeting of the Association of American Universities which was held at Clark University in November. The expanding scope of the universities and their relation to the public school systems engaged chief attention in the Conference of State Universities held at Washington, D. C., Nov. 14-16.

Military Training.—The subject of military training in colleges has been widely discussed during the year, and its introduction is approved by a very large proportion of college and university presidents. President Hadley of Yale University, in commending the effect of the training received by college students in the military camps planned by General Wood, expresses the opinion that if supplemented by a certain amount of theoretical instruction, it might properly be recognized in the requirements for the bachelor's degree.

A conference of college and university presidents with members of the General Staff and officials of the War Department was held during the year. The committee was appointed by Acting Secretary of War Ingraham, who presided over the conference in the absence of Secretary Baker. As a result of the conference, official authorization for the training in military science of students in 16 of the country's universities was given by the War Department to executive officers of these institutions at the conference. A curriculum will be drafted in the interests of those students who take the military course, the completion of which will enable them to obtain commissions as reserve officers. This curriculum will be made effective, when completed, by a general order issued by the Secretary of War.

Miscellaneous Events.—Among notable events of the year was the celebration by Yale University, in October, of the 200th anniversary of its removal from Saybrook to New Haven. The impressive ceremonies were enlivened by a brilliant historical pageant.

The dedication of the new buildings of the Massachusetts Institute of Technology in June was marked by a wonderful demonstration of transcontinental telegraphy. Gifts to the amount of $3,150,000 were announced by President Maclaurin.

Rutgers College celebrated its 150th anniversary on Oct. 13; the Queen of the Netherlands was represented by Chevalier Van Rappard, the Minister of the Netherlands to the United States.

The Harvard Divinity School observed on Oct. 5 the centenary of its recognition as a distinct professional school.

The commencement at Fordham University, New York City, was marked by exercises celebrating the 75th year of its foundation.

The inauguration of Dr. Henry Suzzalo, appointed in 1915 as president of the University of Washington at Seattle, was formally celebrated on March 20. A few days later Dr. E. O. Holland, a graduate of Indiana University, and formerly Fellow in education in Columbia University, was installed as president of Washington State College.

The State University of Iowa, having successfully passed the recent period of storm, enters upon a new era under the presidency of Dr. Walter A. Jessup, who for four years has been at the head of the University College of Education.

The new president of the Colorado School of Mines is Howard G. Parmalee of Denver.

The installation of Ernest Martin Hopkins as president of Dartmouth College on Oct. 6 brought together a brilliant company of distinguished educators. Dr. Ernest Fox Nichols, the former president of Dartmouth, resigned the position to take the professorship of physics in Yale University.

Unusual interest was excited by the appointment of Dr. William McClellan as dean of the Wharton School of Finance and Commerce of

the University of Pennsylvania. It is stated that this is the first appointment of the kind drawn from the business world.

Dr. Abram W. Harris, president of Northwestern University, resigned to accept the secretaryship of the Methodist Board of Education. The trustees have decided to entrust the direction of the university to a committee of the deans.

Dr. Ray Lyman Wilbur was installed as president of the Leland Stanford Junior University, succeeding Dr. John Casper Branner.

Dr. John Widtsoe has been called from the presidency of Utah Agricultural college to that of the University of Utah.

Dr. Robert E. Vinson was installed during the year as president of the University of Texas.

Dr. Frank Butler Trotter, who has been acting president of the University of West Virginia since 1914, has been appointed to the presidency.

Dr. David Snedden, who for six years has held the position of state commissioner of education in Massachusetts, accepted a professorship in Teachers College, Columbia University. Dr. Payson Smith, of the University of Maine, was elected to succeed Dr. Snedden.

Great interest centered in the choice of a successor to the late Booker T. Washington as president of Tuskegee Institute. The choice eventually fell upon Major Robert R. Moton, a graduate of Hampton Institute and commandant of cadets at that institution for many years. Major Moton is distinguished as an orator and writer and is understood to be in full sympathy with the ideals for which Tuskegee stands.

The Spingarn medal, a prize to be awarded annually to the colored man or woman who has rendered the greatest service to the colored race, was bestowed upon Prof. Ernest E. Just, a young scientist and professor in the Howard University Medical School. Professor Just has gained distinction for original work in physiology, biology, and zoölogy.

PROFESSIONAL EDUCATION

Statistics of Professional Schools.—Professional education is given in independent schools and university departments, which are comprised in the following summary, the statistics being for the year 1914-15:

Class	Schools	Instructors	Students	Graduated in 1915	Students Having a Degree
Theology	164	1,533	10,588	1,872	4,202
Law	120	1,462	21,923	4,427	4,048
Medicine	93	7,336	15,182	3,745	2,907
Dentistry	50	1,583	9,647	2,236	259
Pharmacy	75	833	6,107	1,838	82
Veterinary medicine	22	356	2,608	675	23
Total	524	13,103	66,055	14,793	11,521

Class	Value of Grounds and Buildings [1]	Endowment Funds [1]	Benefactions [1]	Total Receipts	Volumes in Libraries [1]
Theology	$23,792,106	$39,232,872	$1,467,055	$4,349,970	2,605,800
Law	5,450,855	2,235,699	90,576	1,688,267	1,236,742
Medicine	30,243,172	23,251,380	2,661,076	7,898,462	776,541
Dentistry	3,346,518	461,915	500	1,164,342	45,821
Pharmacy	2,791,881	205,000	7,049	512,364	98,531
Veterinary medicine	1,690,395	.....	40	320,484	17,755
Total	67,314,427	65,386,866	4,226,296	15,933,889	4,781,190

[1] Includes university departments so far as separately reported.

Medical Education.—The year has witnessed decided advance in the efforts to raise the standard of both medical and legal education. In the case of medical schools the requirement of two years' collegiate work before admission to medical studies is now fairly established and will

probably be in general force by 1918. During 1916, 62 out of 96 medical colleges were exacting this amount of preliminary training, or had announced definitely that the requirement would be enforced in the next year or two. The number of state licensing boards that had adopted the same standard was increased from 10 to 17. At the annual conference in February the Council on Medical Education urged that this standard be adopted, and that the medical training itself should comprise a four years' course to be followed by one year's interneship in a hospital. The amendment to the constitution confirming this action will be voted on in 1917. Subsequently the governing board of the American Medical Association took similar action. This body also determined to coöperate with the efforts now being made to save one or two years of the student's time during the period of elementary and high-school education. The fear that the higher entrance standards would prevent poor boys of great promise from studying for the profession is displayed by the increasing number of scholarships to be won by examination, and the larger endowments and public appropriations for medical schools which enable them to keep the fees lower than would otherwise be possible.

The number of medical schools open to women has been increased during the year by the addition of the medical schools of Columbia and Yale Universities. There remain 28 medical schools, including the medical departments of seven state universities, which are not open to women. It is noticeable, however, that the proportion of women students has not materially increased. Following the precedent of the last two years, several large donations have been given during the year for medical research. The University of Pennsylvania School of Medicine received $150,000 for the establishment of a professorship in surgical research. Columbia University, College of Physicians and Surgeons, received $100,000; Harvard University, $100,000; Johns Hopkins hospital, $150,000; all for medical research. The recommendation was also made that a fund of more than $3,000,000 for the treatment of cancerous, nervous, and similar ailments be given to the University of Pennsylvania hospital. The fund is the estate and increment covered by the will of Anna J. Jeanes, the noted Quaker philanthropist who died in 1908. The latest addition to the number of large gifts for medical education consists of $2,000,000 appropriated by the General Education Board and the Rockefeller Foundation for the establishment of a medical department in the University of Chicago. The University, it is understood, will set aside at least $2,000,000 for the same purpose, will give a site on the Midway valued at $500,000, and will raise a further sum of $3,300,000. The medical school will therefore start with an endowment of almost $8,000,000, making it the most richly endowed of its class.

The first graduate course in public health was established at the University of Pennsylvania in 1909. Ten medical schools now offer such courses, and the Rockefeller Foundation has provided funds for the establishment of a school of hygiene and public health in connection with the medical department of Johns Hopkins University (see also XXVII, *Public Health*).

The extension of graduate medical instruction to localities remote from centers of research is the latest form of university extension in this country and promises to be fruitful in results. The latest experiment in this direction is reported from North Carolina. In this state, since June, 1916, classes of about 15 physicians each have been held in six cities under the auspices of the state Board of Health and the University of North Carolina.

The movement for establishing a National Board of Medical Examiners has resulted in the formation of a voluntary national board which includes in its personnel distinguished experts from the government medical services and physicians of high repute. The first examination conducted by the Board was appointed for Oct. 16, 1916, and great interest is now manifested in the action that shall be taken by state license boards

with reference to the acceptance of the certificate of this national association.

Legal Education.—The influences that make for the improvement of legal education in the United States naturally excite less public interest than those affecting medical education, but with the increase of international complications and delicate questions of the interpretation of laws affecting trade and the rights of neutrals, the subject is becoming one of larger popular interest. Meanwhile, through the efforts of the profession itself, especially as exercised through the activities of the American Bar Association, the conditions of legal education have become the subject of investigation, and the requirements for admission to the study of law are steadily advancing. The Carnegie Foundation for the Advancement of Teaching is engaged in a comprehensive study of the conditions of legal education in this country and issued during the year, in connection with this effort, a special report by Prof. Redlich of Vienna on "The Common Law and the Case Method in American University Law Schools."

Theological Education.—The most interesting movement in regard to theological education is the increased provision for studies pertaining to sociological conditions. These are emphasized in plans for preparing ministers for service in rural communities, in which matter the theological school of Boston University takes the lead. This tendency is further illustrated by the emphasis placed upon training for social service in the International Y. M. C. A. College at Springfield. The three-year course has been extended to four years, arranged to include scientific and ethical subjects, and provision is made in the curriculum for a special course in modern religious thought, under which head are included the following subjects: the new conception of the universe, the evolution of man, the new psychology, and the new social consciousness.

Schools for Social Workers.—Among professional schools should be counted five training schools for social workers which confer degrees upon those who complete the course; four of these schools, situated respectively in New York, Chicago, Boston, and St. Louis, have received grants in aid from the Russell Sage Foundation. The New York School will ultimately be in possession of an endowment exceeding $1,000,000 from the bequest of the late John S. Kennedy. The Pennsylvania School for Social Service grew out of courses of lectures on the practical aspects of social work maintained in Philadelphia.

EDUCATIONAL FOUNDATIONS AND ASSOCIATIONS

General Education Board.—The current annual report of the General Education Board covers the financial operations for the year ending June 30, 1916. The income of the Rockefeller fund for the year was $2,065,736, which with the balance from the previous year made a total of $8,278,792 available for disbursement. The Board has added to its functions plans for promoting the investigation of educational problems. The work has begun with investigations of the Gary system and the junior high school.

The following were appropriations made by the Board for the year 1916, not including the sum of $8,637.51 appropriated from the income of the Anna T. Jeanes fund and $50,000 from the principal of the Laura S. Rockefeller fund:

Universities and colleges for whites, for endowment	$900,000
Medical schools, white	250,000
Colleges and schools for negroes	127,800
Professors of secondary education	34,130
State agents of rural schools for whites	52,300
State agents of rural schools for negroes	36,133
Negro rural school fund	10,000
County training schools for negroes	10,000
Home-makers' clubs for negroes	33,500
Consolidated rural schools	25,000
Educational investigation and research	63,993
Conference	1,018
Supplemental fund	10,000
Farm demonstration work in Maine (including boys' and girls' clubs)	21,500
Farm demonstration work in New Hampshire	8,500
Total	$1,583,875

Carnegie Foundation for the Advancement of Teaching.—The tenth annual report of the Carnegie Foundation brings the record of its activities through the fiscal year ending Sept. 30, 1915. The report shows a total endowment of $14,250,000, an accumulated surplus of $1,255,000, and an annual expenditure of $766,000. Of this $37,000 was spent in administration, $55,000 in educational inquiry, and $674,000 in retiring allowances and pensions. At the close of the year there were in force 327 allowances and 118 widow's pensions, the general average being $1,552. Since its organization, the division of educational inquiry has issued 10 reports and eight bulletins, of which some 200,000 copies have been distributed free of charge. Progress has been made in the comprehensive studies relating to legal education, engineering education, and the training of teachers. The report of the Foundation discusses problems relating to pensions for teachers, a subject which led to the publication during the year of a "comprehensive plan of insurance and annuities for college teachers." This document, issued originally as confidential, was afterward given to the public and caused great excitement, as it indicated the purpose of the Foundation to substitute for the policy originally adopted a contributory plan of pension. The announcement has led to critical examinations of the history and proceedings of the Foundation, which, because of its attitude toward the higher institutions of this country, has become a proper subject of public inquiry.

National Education Association.—The fifty-fourth annual convention of the National Education Association was held in New York City, July 1-8, and was marked by large attendance, immense enthusiasm and social events on a lavish scale. The conviction was general that the Association had recovered from the effect of disintegrating influences and was entering upon a new era of efficient and united activity. The resolutions emphasized the questions that at present engage chief attention in educational circles. In particular should be noted: a resolution to request the appointment by the President of the United States of a commission to investigate and report upon the condition of the women on the farm and of the rural home of the United States; a resolution endorsing movements for the promotion of citizenship education and extending educational facilities to the adult alien or foreign-born residents of this country; and a resolution emphasizing the importance of the teaching profession and urging legislation that shall assure to teachers more adequate compensation and secure tenure after a probationary period is passed.

The financial report of the Association shows that the permanent invested fund amounts to $188,500, yielding a net revenue of $7,178. During the fiscal year ending June 30, 1916, the total receipts of the Association from all sources, including the balance from the previous year, were $42,529; while the total expenses were $37,158.

The president elected for the ensuing year is Robert J. Aley, president of the University of Maine, Oronto, Me.; the secretary, Durand M. Springer.

The American Association of University Professors, formed in 1915, entered upon its career at a time when the dignity and freedom of the teaching profession were threatened in various ways. This Association has had full occasion during the year to prove the value of its mission. Directly upon its formation the Association was called upon to investigate cases of apparent infringement of the rights of professors at three state universities and the University of Pennsylvania. Committees were appointed by the society in accordance with these requests to investigate the several cases, and the report on the case involving the University of Utah was published in 1915 (*A. Y. B.*, 1915, p. 786). During 1916 the reports of the remaining committees have appeared. These publications are marked by a judicial tone that carries the conviction of impartiality as well as ability in dealing with one of the most delicate and complicated problems of university operations.

The Second Pan-American Scientific Congress was held in Washington, Dec. 27, 1915, to Jan. 9, 1916. The programme of the Congress covered a very wide range of subjects, scientific, international and sociological. The educational programme was exceptionally strong, and the discussions showed a prevailing conviction on the part of the delegates that schools and higher institutions may be made effective agencies for creating and maintaining cordial relations between the Republics of the new world. To this end it was recommended by delegates from several of the countries, that the study of English in Latin America and of Spanish in Anglo-Saxon America should be extended and deepened. (See also III, *International Relations;* and IV, *Latin America.*)

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LIBRARIES

James I. Wyer, Jr.

General Survey.—Besides the half-dozen distinct characteristics of recent American library development which were noted in Year Book for 1914 (p. 794), mention should be made of a few subjects which are particularly to the fore at the moment, which appear oftenest on the programmes of library meetings and claim most space in professional journals.

The logical opportunities for co-operation between public schools and libraries were definitely recognized nearly 20 years ago, when a Library Section of the National Education Association was launched, since which time like sections have been created

in many state teachers' associations. The desired *entente* has languished and not till very lately has there been what fairly can be called a "movement" towards providing in high schools ample, well organized libraries, competently administered by trained librarians. District libraries, too, have come in for new attention from state library or educational authorities in matters of book selection, grants of money, organization and inspection. High schools are training pupils and normal schools their students in the use of books and libraries, so that prospective teachers may go to their work with full knowledge of the possibilities which a library presents.

The library's part, both direct and collateral, in assimilating and Americanizing the immigrant offers a considerable field for service in providing books in native tongues, and in personal service both in city and country. Massachusetts, especially through its Free Library Commission, has made notable beginnings in this work.

From coast to coast a wave of library publicity marks a new militancy in pushing the free use of books. The bold and striking effects of print and poster (adopted from commercial advertising), window dressing, newspaper space, follow-up methods, bill boards and ubiquitous signs are some characteristics of the new campaign.

Side by side with the extreme differentiation and keener competition in commercial enterprise, in all subjects of instruction and research, and in professional and governmental life and practice, appears the "special library," now recognized as a distinct type, boasting its own national organization, serving a restricted and exacting constituency and attracting to such service those content with narrower and less inspiring opportunities than are offered in the various forms of free-library extension.

The European War and Libraries.—The war in Europe has affected library work in the United States as it has affected everything else. Because of the financial panic which followed the beginning of the war, library appropriations were reduced in many states and cities, and as it is always harder to get appropriations increased than it is to prevent reduction, it is not probable that the aggregate money available for library purposes throughout the country is even yet equal to what it was before the war.

The war at once heavily curtailed the number of books published and seriously affected in the same way periodical publications, many of the latter being definitely discontinued, others indefinitely suspended or diminished in size and frequency of issue. Libraries can manage to worry along fairly well without so many books and periodicals as have been printed in the last few years. In this respect the war is even something of a blessing. Several hundred more periodicals could well be spared, and a further cut of several thousand in the annual output of books would make library problems of book selection infinitely easier. The present uncertainties of war, peace, and military operations, however, not only result in fewer books and journals, but make it exceedingly annoying and inconvenient to get those that are still printed in Europe. The British embargo on books and mail from Teutonic countries makes prompt receipt of current periodicals impossible and any receipt of them uncertain. The importation of printed matter from any European country is attended with additional risk, expense and official red tape, while any saving to library funds resulting from periodicals discontinued and books not printed is made up or more than made up by the flood of war books and their insistent appeal to the library patronage and purse. The prices of books and of periodicals that have survived the stress of war conditions tend steadily to increase. Everyman's Library has been raised in price from 35 cents and 75 cents to 40 cents and 80 cents per volume, and many other standard series in proportion, while many publishers, including some of first rank, have raised or are about to raise list prices on their entire lists or on all new books. Periodicals and newspapers are using not only less but poorer paper at greater cost to subscribers.

The Continental second-hand markets are practically closed to Americans, though it is possible to import from the Allied countries at heavy risk, expense and delays. The British second-hand market seems active, and the fact that its prices are but little lower than before the war appears to show that American libraries are patronizing it freely. It seems likely that after the war many private libraries will come on the market, thus affording chances to acquire rarities seldom offered.

From several sources personal and semi-official requests have reached American libraries, and have been presented to the council of the American Library Association, looking toward aid in restoring the libraries of France and Belgium. The Association has named a committee to collect authoritative information as to French and Belgian conditions and report at the mid-winter meeting in Chicago. The fate of the International Institute of Bibliography at Brussels is not definitely known, though unofficial word comes that its collections are still intact. The interruption of its work, however, and the stoppage of all increase in its collections is, and will long be, a serious blow to coöperative efforts for international bibliography.

Meetings.—Continually larger library meetings testify emphatically to the profit and renewed inspiration which they furnish. Fourteen hundred in attendance on the fortieth annual meeting of the American Library Association at Asbury Park, N. J., June 26-July 1, broke all previous records for numbers and enthusiasm. The one regrettable feature was the absence, due to what later proved to be a fatal illness, of the president, Miss Mary W. Plummer. The theme, "The Library and Democracy," which ran strongly through the general sessions, not only presented the work and opportunities of the public library as an impartial conserver of truth, an agency for popular education and a potent auxiliary in welding into civic unity and efficiency a vast immigrant population, but inspired a notable group of papers by literary critics who discussed democracy as manifest in current fiction, poetry and drama. Frequent meetings of six separate, though affiliated, national organizations kindred in aim, and as many more sections of the parent association, afforded abundant opportunity for specialized discussions of professional practice and technic. Each year sees a greater number of these agencies, both formal and impromptu, for comparison of views and wide-ranging discussion of library problems.

The reunion dinners of graduates of the different library schools formed a picturesque and enlivening feature, one highly significant too, when it is noted that well over one-fourth of the total conference attendance consisted of these specially trained men and women, the products of schools, the first of which is not 30 years old. This pioneer school, the New York State Library School at Albany, was represented at Asbury Park by 125 former students, or more than one-seventh of all its matriculants.

The officers of the Association for 1916-17 are: president, Walter L. Brown, Buffalo Public Library; vice-presidents, Harrison W. Craver, Carnegie Library, Pittsburgh, and George H. Locke, Toronto Public Library; secretary, George B. Utley; executive board, the foregoing and Josephine A. Rathbone, School of Library Science, Pratt Institute, Brooklyn, and Arthur L. Bailey, Wilmington (Del.) Institute Free Library.

The Pennsylvania and New Jersey bi-state meeting at Atlantic City, with 330 enrolled, and the New York Library Association at Richfield Springs, Sept. 11-16, with 270 in attendance, were the principal local meetings. They offered exceptionally attractive programmes and attracted attendance from many other states.

Gifts.—The appeal of the library as a worthy recipient of books and money is an obvious and a very strong one. The aggregate of recorded gifts to American libraries must be in excess of $125,000,000, to which sum several millions are added each year. The American Library Association reports the following figures which are interesting as showing the continuing magnitude of the Carnegie gifts and their undoubted stimulus to other givers:

Year	Donor	Amount
1913	Carnegie Corporation	$2,371,642
	Other donors	2,056,599
1914	Carnegie Corporation	1,834,395
	Other donors	1,836,806
1915	Carnegie Corporation	1,037,429
	Other donors	1,083,172
	Total	10,220,043

The Carnegie Corporation reports that up to Jan. 1, 1916, the gifts made for library buildings by Andrew Carnegie and the Carnegie Corporation totaled $63,817,796, being for 2,659 public libraries an average of $24,000, and for 116 college libraries an average of $32,533.

Buildings.—A notable group of public-library buildings is under way in six of the largest cities of the country: Brooklyn, where a building to cost when complete about $5,000,000 is well started; Cleveland, where plans are perfecting and architects about to be chosen for a library as part of the city's civic center; Detroit; Indianapolis, where a million-dollar building is well under construction; St. Paul, where a joint building will house the Public Library and the reference library founded by J. J. Hill; and San Francisco, where also the library figures in the civic center. All of these cities are growing so fast that in one way it is fortunate that definite buildings have waited till they may more reasonably approximate the cities' needs than would have resulted from buildings erected ten years ago.

Deaths and Appointments.—The library profession has lost by death during 1916: Jan. 12, John C. Schwab, librarian of Yale University; Feb. 23, John Thomson, for 24 years librarian of the free library of Philadelphia; June 8, E. W. Mundy, for 22 years librarian of the Public Library, Syracuse, N. Y.; Aug. 21, William Ives, for 52 years librarian of the Buffalo Library; Sept. 3, Martha T. Wheeler, for 22 years connected with the New York State Library and author of the standard treatise on indexing; and Sept. 20, Mary W. Plummer, ex-president of the American Library Association.

The more important appointments of the year are: George Watson Cole, librarian of Henry E. Huntington's library; Andrew Keogh, librarian of Yale University; John Ashhurst, librarian of the Free Library of Philadelphia; Charles E. Rush, librarian of the Des Moines (Ia.) Public Library; Jesse Cunningham, librarian of the St. Joseph (Mo.) Public Library; Charles Seymour Thompson, librarian of the Public Library in Savannah, Ga.

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XXXII. CHRONOLOGY AND NECROLOGY

AMERICAN CHRONOLOGY

JANUARY

3.—Secretary Lansing instructs the American Ambassador at Vienna to make informal inquiries as to the identity of the submarine which sank the *Persia*.

4.—Both houses of Congress reassemble after the holiday recess.

The United States Government addresses to Great Britain a note protesting against interference by British authorities with American mails in transit between neutral ports.

5.—American marines in Port au Prince, Haiti, suppress a revolutionary insurrection contemplating the assassination of President Dartiguenave.

6.—The Senate adopts a resolution calling upon the President for information as to the stability of the present Government of Mexico and the relations of the United States therewith.

7.—Count von Bernstorff, the German Ambassador, delivers a note containing a formal assurance that German submarines in the Mediterranean are under orders to operate strictly in accordance with international law.

Striking steel workers riot in East Youngstown, Ohio, and burn and loot a large part of the business section; three persons are killed and property valued at $800,000 destroyed.

8.—The House passes the bill opening water powers on public lands to development under lease.

The Senate Committee on Suffrage reports favorably a resolution to amend the Constitution to extend the suffrage to women.

Secretary Lansing publishes a German note of Nov. 29, 1915, on the case of the *William P. Frye* which accepts the American contentions regarding the necessary provisions for the safety of the crews of vessels sunk by submarines.

9.—A jury in the U. S. District Court in New York acquits six and disagrees as to five of the directors of the New Haven Railroad on trial for conspiracy under the Sherman Act.

10.—Nineteen Americans are taken from a train, robbed and killed by Mexican bandits at Santa Ysabel, 50 miles west of Chihuahua.

11.—The Progressive National Committee in session at Chicago decides to hold the national convention of the party in Chicago on June 7 and adopts a declaration of principles which opens the way to fusion with the Republican party.

12.—The United States Government presents to the Carranza Government in Mexico a demand for the immediate capture and punishment of the bandits responsible for the murder of American citizens at Santa Ysabel.

15.—An explosion in the submarine *E 2* under repair at the Brooklyn Navy Yard wrecks the interior and kills four men.

16.—Carranza assures the United States Government of his determination to capture and punish the perpetrators of the Santa Ysabel massacre.

18.—Secretary Lansing addresses a note to the Entente powers suggesting a code for the conduct of submarine warfare and recommending the complete disarmament of merchant vessels, concluding with the announcement that the United States is considering a declaration that armed merchant vessels should be held to be auxiliary cruisers.

19.—The German Government informs Ambassador Gerard that no German submarine was concerned in the sinking of the *Persia*.

24.—The U. S. Supreme Court hands down a decision in Brushaber *v.* Union Pacific Railroad Co., upholding the constitutionality of the Federal income tax.

25.—Secretary Lansing addresses to the British Government a note protesting against a pending extension of the Trading with the Enemy Act prohibiting British subjects from trading with persons or firms in neutral countries of enemy nationality or association.

The House passes the Federal Aid Roads bill, carrying an appropriation of $25,000,000.

27.—President Wilson makes a strong plea for military preparedness in two speeches in New York.

28.—President Wilson nominates Louis D. Brandeis of Boston as associate justice of the Supreme Court.

29.—President Wilson, speaking for preparedness at Cleveland, declares that it may not be possible to avoid entering the war and still maintain the honor of the United States.

FEBRUARY

1.—The British liner *Appam* is brought into Norfolk, Va., by a German prize crew.

The Austro-Hungarian Government informs Ambassador Penfield that no Austrian submarine was concerned in the sinking of the *Persia*.

2.—The House passes the Child Labor bill.

The Senate, by the casting vote of Vice-President Marshall, adopts the Clarke amendment to the Philippines

bill, guaranteeing the islands complete independence not later than March 4, 1921.

The Senate Committee on Foreign Relations reports favorably on the treaties with Nicaragua and Colombia, with amendments to the latter reducing the cash payment to $15,000,000 and making the expression of regret mutual.

4.—The Senate passes the Philippines bill.

Sir Cecil Spring-Rice, the British Ambassador, delivers a note demanding the release of the *Appam* to her owners.

7.—The House passes bills increasing the number of cadets at the Naval Academy, and making an appropriation for enlarging facilities at the Mare Island Navy Yard.

Franz Bopp, German Consul-General at San Francisco, Baron E. H. von Schack, Vice-Consul, and 30 others are indicted by a Federal grand jury at San Francisco for conspiracy to destroy ammunition plants and violate the neutrality laws of the United States.

8.—Count von Bernstorff delivers a note demanding asylum for the captured British liner *Appam* until the end of the war under the terms of the Prussian-American treaty of 1828.

Count von Bernstorff notifies Secretary Lansing informally of the intention of the German Government to declare all armed belligerent merchant vessels liable to be sunk without warning by German naval vessels after Feb. 29.

9.—The Senate passes the bills increasing the number of naval cadets and enlarging navy-yard facilities.

10.—Lindley M. Garrison, Secretary of War, and Henry Breckinridge, Assistant-Secretary, resign.

15.—Elihu Root, speaking before a state convention of Republicans in New York, reviews and denounces President Wilson's conduct of foreign relations.

The resignation of George T. Marye, Ambassador to Russia, is announced.

16.—Count von Bernstorff submits a revised draft of the language of the proposed basis of settlement of the *Lusitania* issue; Secretary Lansing declares that the whole question of submarine warfare is again under consideration.

17.—President Wilson transmits to the Senate a report that 76 Americans had been killed in Mexico in the last three years, and 36 by Mexicans on American soil.

18.—The Senate ratifies the treaty with Nicaragua granting the United States perpetual right of way across Nicaragua for a transisthmian canal.

19.—The German prize *Appam* is seized by Federal officers at Newport News on a writ of libel sued out by the owners.

23.—The U. S. District Court of Baltimore hands down a decision denying the Government's suit for the dissolution of the American Can Co.

24.—President Wilson, in a letter to Senator Stone, declares the United States unable to change international law on the arming of merchant vessels and declines to warn American citizens against travel on belligerent ships.

25.—The Senate confirms the nomination of Henry Prather Fletcher as Ambassador to Mexico.

28.—The Senate ratifies the convention with Haiti establishing a financial and police protectorate by the United States.

The House passes the Post-office Appropriation bill.

Count von Bernstorff delivers a memorandum assuring the United States Government that German submarines will sink no enemy merchant vessels unwarned without proof of the presence of armament.

29.—President Wilson addresses a letter to Representative Pou of the House Committee on Rules urging an early vote in Congress on pending resolutions with regard to travel on armed liners.

MARCH

2.—Secretary Lansing informs Count von Bernstorff that the German prize *Appam* is not entitled to indefinite asylum in American waters under the Prussian-American Treaty of 1799.

3.—The Senate tables an ironic resolution offered by Senator Gore (Okla.), in amendment of his original resolution warning American citizens against travel on belligerent armed merchant vessels.

4.—Senator Chamberlain (Del.) introduces a bill for the increase and reorganization of the military forces, providing for a Regular Army of 178,000.

6.—Mr. Hay (Va.) introduces in the House a bill for the increase and reorganization of the military forces, providing for a Regular Army of 140,000.

The Senate confirms David R. Francis of St. Louis as Ambassador to Russia, and Joseph H. Shea as Ambassador to Chile.

7.—The House tables the resolution offered by Mr. McLemore (Tex.) warning American citizens against travel on armed belligerent merchant ships.

President Wilson nominates, and the Senate confirms, Newton D. Baker as Secretary of War.

8.—The Senate passes a bill opening water powers on public lands to development under lease.

Count von Bernstorff delivers a memorandum from the German Government explanatory of its attitude on the conduct of submarine warfare against armed enemy merchant vessels.

9.—A large band of Mexicans led by Francisco Villa raid the town of Columbus, N. M., burning many buildings and killing nine American soldiers and eight civilians; Secretary Lansing notifies the Mexican Ambassador that a punitive expedition will be sent into Mexico in pursuit of Villa.

Newton D. Baker takes the oath of office as Secretary of War.

Theodore Roosevelt issues at Port of Spain, Trinidad, a statement of the conditions under which he would accept a nomination for the Presidency.

10.—Carranza replies to the representations of the United States with a request for reciprocal concession of the right of armed forces of Mexico to pursue bandits across the American border.

11.—Three additional regiments of cavalry are ordered to the Mexican border.

13.—The United States Government accepts Carranza's proposed reciprocal agreement for the pursuit of bandits across the Mexican frontier; Secretary Lansing issues a statement that no intervention in the internal affairs of Mexico is contemplated in the punitive expedition.

15.—The American punitive expedition crosses the border into Mexico in two columns, from Columbus and Palomas, N. M., under General Pershing and Colonel Dodd.

16.—The House repeals the clause of the Underwood Tariff Act making sugar duty-free after May 1, 1916.

17.—Carranza addresses a note to the United States Government protesting against the entry of American troops into Mexico before a definite agreement was reached on the conduct of punitive expeditions.

18.—The Mexican Government addresses a note to the United States suggesting the terms of a protocol on the pursuit of bandits across the border by military forces; the United States Government requests of Carranza permission to ship military supplies for the American troops over the Mexico Northwestern Railway.

21.—The Senate passes a bill appropriating $11,000,000 for the purchase or construction of a Government armor plant.

22.—The Senate passes a bill doubling the cadet corps at the Military Academy.

The United States Government submits to Carranza a revised protocol on the pursuit of bandits across the border.

23.—The House passes the National Defense bill.

24.—It is announced at Washington that all the Entente powers have formally rejected Secretary Lansing's proposals for the disarming of merchant ships.

The French Channel steamer *Sussex*, with several Americans on board, is sunk without warning by a German submarine in the English Channel.

25.—Carranza replies to the proposals of the United States Government, suggesting some modifications and insisting that a time limit be set to the American expedition.

27.—The Turkish Government disclaims any responsibility for the sinking of the *Persia*.

28.—Both houses of Congress pass an Urgent Deficiency bill appropriating $8,600,000 for emergency uses of the army.

Secretary Lansing instructs Ambassador Gerard to inquire of the German Government whether the *Sussex* was torpedoed by a German submarine.

29.—General Carranza grants permission for the shipment of supplies, except munitions, over the Mexico Northwestern Railroad to the American punitive force.

American cavalry under Col. George A. Dodd rout a large force of Villistas at San Geronimo.

30.—The House passes the Immigration bill.

APRIL

3.—The United States Government addresses to Carranza a new draft of a protocol, but excepts the present expeditions from the limitations established therein.

Sir Cecil Spring-Rice delivers a joint reply of the British and French Governments to the protest of the United States Government against the detention and censorship of neutral mails.

5.—Theodore Roosevelt issues a statement declaring his unwillingness to accept the Republican nomination for President unless the people are prepared to endorse his ideas of national defense.

7.—Carranza inquires the intentions of the United States as to further penetration of the punitive expedition into Mexico and the period of its maintenance of the pursuit of Villa.

10.—The German Government replies to inquiries of the United States Government as to the sinking of the French steamer *Sussex;* it denies that a German submarine sank the *Sussex* but admits that a ship of different type was sunk without warning at the same time and place.

11.—The Senate passes a bill suspending for four years the free-sugar clause of the Underwood Tariff Act.

The House passes the River and Harbor Appropriation bill, carrying appropriations of $40,000,000.

The Nicaraguan Congress ratifies the treaty granting exclusive canal-route rights to the United States.

12.—An American force, two members of which enter the town unarmed, are attacked by a mob of Mexicans and Carranzist troops at Parral and two Americans are killed; a supply train of General Pershing's column is attacked from ambush; Carranza addressed a note to the United States Government proposing a discussion of the withdrawal of the American troops.

15.—The Panama Canal is reopened for traffic.

17.—The House passes the bill doubling the cadet corps at the Military Academy.

A Federal grand jury at New York indicts Capt. Franz von Papen, Capt. Hans Tauscher, and three others on the charge of conspiring to destroy the Welland Canal.

18.—The Senate passes a substitute National Defense bill providing for a standing Regular Army of 250,000 men.

The United States addresses to Germany a note of warning that diplomatic relations will be severed unless the German Government immediately declare and effect an abandonment of its present methods of submarine warfare.

Wolf von Igel, claiming to be an under secretary of the German Embassy, is arrested in New York charged with complicity in the conspiracy to destroy the Welland Canal.

19.—President Wilson addresses the two houses of Congress in joint session on the subject of the final note of warning to Germany.

21.—The Japanese Ambassador trans-

mits to President Wilson a protest against certain provisions of the Immigration bill pending in Congress relating to Asiatic immigration.

22.—The Senate approves the House bill repealing indefinitely the free-sugar clause of the Underwood Tariff Act.

24.—Sir Cecil Spring-Rice delivers the reply of the British Government to the American note of Oct. 21, 1915, relating to British restraints on commerce.

25.—The resignation of Henry Morgenthau as Ambassador to Turkey is announced.

26.—Secretary Lansing publishes a memorandum dated March 25 defining the law of nations pertaining to defensively armed merchant vessels and their rights in neutral ports and on the high seas.

27.—A caucus of the House Democrats approves the Philippines bill with the Clarke amendment guaranteeing independence within four years; 28 Democrats refuse to be bound by the caucus action.

28.—A Federal grand jury at New York indicts Walter T. Scheele and eight other Germans on charges of conspiracy to destroy munitions ships.

29.—Gen. Hugh L. Scott, Chief of Staff, and Gen. Alvaro Obregon meet in conference at Juarez, Mexico, on the American punitive expedition.

30.—The national convention of the Socialist Labor party in session at New York nominates Arthur E. Reimer of Boston for President and Caleb Harrison of Chicago for Vice-President.

MAY

1.—The House rejects the Clarke amendment to the Philippines bill.

2.—The House passes the Agricultural Appropriation bill.

3.—Generals Scott and Obregon draft a tentative agreement on the conduct and conditions of withdrawal of the American punitive expedition in Mexico.

4.—The Senate passes the Rural Credits bill.

President Wilson approves the agreement reached by Generals Scott and Obregon at El Paso.

The German Government, replying to the American note of April 20, gives assurances that submarine warfare against merchant vessels will be conducted according to the rules of international law but reserves liberty to revise its new orders should the United States not secure a modification of the British blockade.

5.—Mexican bandits raid the villages of Boquillas and Glenn Springs, Texas, killing three American soldiers and one civilian; American troops rout a band of Villistas near Ojo Azuleo.

6.—President Carranza approves the Scott-Obregon agreement except as to minor points.

8.—The House rejects the Senate amendment to the National Defense bill authorizing for the army a peace strength of 250,000, and adopts an amendment appropriating $20,000,000 for the purchase or construction of a nitrate plant.

The Senate passes the Federal Aid Roads bill.

An American cavalry force crosses the Mexican border in pursuit of the Glenn Springs raiders.

The United States Government accepts the assurances of the German Government of a new submarine policy but rejects any conditions making its execution contingent upon a modification of the British blockade.

The German Government delivers a note to the United States accepting responsibility for the sinking of the *Sussex* and offering apology and reparation for injury to American citizens.

Robert Fay, Walter Scholz and Paul Daeche are convicted by a jury in New York of conspiracy to destroy munitions ships.

9.—President Wilson calls the organized militia of Texas, Arizona and New Mexico into the service of the United States and orders the dispatch of these troops and 4,000 more regulars to the Mexican border.

11.—Theodore Roosevelt, in a letter to the secretary of the Roosevelt Non-Partisan League, approves a movement to secure his nomination for the Presidency by the Republican and Progressive parties.

15.—The House passes the Rural Credits bill.

The Senate rejects the nomination of George Rublee as a member of the Federal Trade Commission.

17.—The House passes a bill appropriating $50,600,000 for flood control and improvement of the Mississippi and Sacramento rivers.

The Senate adopts the conference report on the National Defense bill.

18.—The House Committee on Naval Affairs rejects the Administration's five-year naval programme.

20.—The House adopts the conference report on the National Defense bill, and passes the Shipping bill.

22.—The Mexican Government addresses to the United States a long note insisting on immediate withdrawal of the American forces in Mexico and demanding an unequivocal declaration of the purpose and intentions of the United States Government.

23.—The House passes the Porto Rico bill.

24.—Secretary Lansing addresses identic notes to the British and French Governments renewing the American protest against the detention and seizure of neutral mails and demanding a radical change in blockade methods.

27.—President Wilson, addressing the first convention of the League to Enforce Peace at Washington, declares the willingness of the United States to join a league of nations to maintain the freedom of the seas, protect small states against aggression, and stop wars begun in violation of international treaties.

29.—The Senate passes the River and Harbor Appropriation bill, carrying appropriations of $44,000,000.

31.—The House adopts an amendment to the Naval Appropriation bill authorizing the construction of an armor-plate plant at a cost of $11,000,000.

JUNE

1.—The Senate confirms the nomination of Louis D. Brandeis to the U. S. Supreme Court.

2.—The House passes the Naval Appropriation bill.

3.—President Wilson signs the National Defense Act.

5.—Louis D. Brandeis takes the oath of office as associate justice of the U. S. Supreme Court.

7.—The national conventions of the Republican and Progressive parties open in Chicago.

8.—The Republican National Convention at Chicago adopts a platform; the Progressive Convention requests the appointment of committees of conference on the reunion of the two parties.

10.—Charles E. Hughes of New York is nominated for President by the Republican National Convention on the third ballot and accepts in a message criticizing the Wilson administration; Theodore Roosevelt is nominated for President by the Progressives but declines the nomination; Charles W. Fairbanks of Indiana is nominated for Vice-President by the Republicans, and John M. Parker of Louisiana by the Progressives; both national conventions adjourn.

Charles E. Hughes tenders, and President Wilson accepts, his resignation as associate justice of the U. S. Supreme Court.

14.—The Democratic National Convention opens in St. Louis.

15.—The Democratic National Convention renominates Woodrow Wilson for President and Thomas R. Marshall for Vice-President by acclamation.

Mexican bandits cross the Rio Grande and attack the American patrol at San Ignacio, Texas, killing three soldiers and wounding six.

16.—The Democratic National Convention adopts a platform and adjourns.

Gen. Jacinto Trevino, Carranzist commandant at Chihuahua, notifies General Pershing under specific instructions from Carranza that any movement of American troops to the south, east or west of their present line will be considered a hostile act.

Mexican bandits attack the American patrol near San Benito, Tex.

17.—American cavalry crosses the Mexican border in pursuit of the San Benito raiders; General Pershing informs General Trevino that his authority cannot be recognized to govern the movements of the American expedition.

The House passes the Pension Appropriation bill.

18.—President Wilson calls out the organized militia for service on the Mexican border.

A landing party from the American gunboat *Annapolis* at Matzalan, Mexico, is fired on and returns the fire; one American is wounded and two are taken prisoners but later released.

20.—Secretary Lansing delivers to the Mexican Ambassador a note declining to withdraw the American punitive expedition until the protection of the border is assured.

21.—A scouting party of two troops of American cavalry is attacked by Mexican troops at Carrizal, near Villa Ahumada, Chihuahua; over 20 Americans are killed and 22 taken as prisoners to Chihuahua.

The militia of California, Missouri and Kansas are ordered to the Mexican border.

Secretary Lansing addresses a note to the Austro-Hungarian Government demanding reparation for the attack on the American steamer *Petrolite* by an Austrian submarine.

22.—The House passes the Fortification Appropriation bill.

The Mexican Ambassador delivers a note claiming and protesting against aggressive action of the American troops at Carrizal.

The War Department orders the immediate movement of 10,000 militia from western and central states to the Mexican border.

23.—The House passes a joint resolution authorizing the President to draft the organized militia into the military service of the United States and appropriating $1,000,000 for the support of dependents of mobilized members.

The War Department orders department commanders to send militia units to the Mexican border as soon as they are reasonably ready for service.

24.—The Mexican Ambassador delivers a note explaining the Carrizal incident as a consequence of the orders to General Trevino not to permit American forces to move east or west from their bases.

The U. S. District Court at New York hands down a decision dissolving the Corn Products Refining Co. as a monopoly in restraint of trade.

25.—Secretary Lansing addresses to the Mexican Government a note demanding the release of the prisoners taken at Carrizal and a prompt statement by the Carranza Government of its intended course of action.

26.—The Senate adopts the resolution drafting the organized militia into the service of the United States but rejects the provision for the support of dependents.

The House passes the Army Appropriation bill.

The Progressive National Committee, in session at Chicago, adopts a resolution indorsing Charles E. Hughes for President, as recommended in a letter from Theodore Roosevelt.

28.—The 22 American soldiers and one scout held as prisoners of war at Chihuahua are released by orders of President Carranza.

29.—The Senate passes the Post Office Appropriation bill.

30.—Capt. Hans Tauscher, American representative of the Krupp Works, is acquitted by a jury in New York of the charge of conspiracy to violate the neutrality laws of the United States.

JULY

1.—The House passes a bill appropriating $2,000,000 for the support of

dependent families of mobilized members of the militia.

The Senate Committee on Naval Affairs reports the Naval Appropriation bill with a three-year building programme of 10 battleships and six battle cruisers.

3.—President Wilson signs the resolution drafting the organized militia into the Federal service.

4.—The Mexican Government returns a conciliatory reply to the American notes of June 20 and 25.

7.—Secretary Lansing replies to the Mexican note of July 4 accepting the proposal of negotiations to settle the difficulties between the United States and Mexico.

9.—The German submarine freighter *Deutschland* lands at Baltimore.

10.—The House passes the General Revenue bill.

11.—President Wilson signs the Federal Aid Roads Act, authorizing the expenditure of $85,000,000.

The Mexican Government replies to the American note of July 7 with a proposal of a joint commission to settle outstanding differences.

12.—The British Government declines to approve an offer of the American Red Cross to send a commission to Germany to receive and supervise the use of Red Cross shipments of hospital supplies.

14.—President Wilson nominates Judge John H. Clarke of Ohio as associate justice of the U. S. Supreme Court.

15.—The State Department rules that the German submarine *Deutschland* is an unarmed merchant vessel.

17.—President Wilson signs the Farm Loan Act.

The Senate confirms the nomination of Representative James Hay of Virginia as judge of the Court of Claims.

18.—Robert W. Woolley resigns as Director of the Mint.

21.—The Senate passes the Naval Appropriation bill, carrying a building programme of 157 ships in three years.

The British Government replies to specific complaints in the American protest against the British mail censorship.

President Wilson addresses personal messages to the rulers of Great Britain, France, Russia, Germany and Austria-Hungary suggesting fresh consideration of measures for the relief of Poland.

The Prohibition National Convention in session at St. Paul nominates J. Frank Hanly of Indiana for President and Ira D. Landrith of Tennessee for Vice-President.

24.—The Senate confirms the nomination of John H. Clarke as associate justice of the Supreme Court.

26.—The United States Government addresses a note to Great Britain protesting against the blacklisting of American concerns under the Trading with the Enemy Act.

27.—The Senate passes the Army Appropriation bill, carrying a total of $314,000,000.

President Wilson nominates Charles E. Lobdell of Kansas, George W. Norris of Pennsylvania, Wm. S. A. Smith of Iowa, and Herbert Quick of West Virginia as members of the Farm Loan Board.

The British Government communicates to the American Ambassador the terms on which it will permit the shipment of foodstuffs for civilians into territory occupied by the Germans.

An arbitration treaty on the Bryan plan between the United States and Honduras is signed at Washington.

28.—The United States Government formally accepts the Mexican proposal of a joint commission.

29.—The U. S. District Court at Norfolk, Va., hands down a decision awarding to her owners the British steamer *Appam,* claimed as a prize by her German captors.

30.—The British Ambassador delivers a memorandum explanatory of the scope of the British blacklist of American concerns.

Explosions and fire in the plant of the National Storage Co. on Black Tom Island, Jersey City, causes the loss of three lives and property damage estimated at $20,000,000.

31.—Daniel C. Roper, first assistant postmaster-general, resigns.

Two Americans are killed by Mexican bandits near Fort Hancock, Texas.

Charles Evans Hughes is formally notified at New York of his nomination to the Presidency and accepts in a speech assailing the record of the Wilson administration.

AUGUST

1.—Charles E. Hughes declares himself in favor of an amendment to the Federal Constitution extending the suffrage to women.

The German merchant submarine *Deutschland* sails from Baltimore.

2.—The Senate confirms the President's nominations to the Farm Loan Board.

3.—The Mexican Government announces the appointment of Luis Cabrera, Ygnacio Bonillas and Alberto Pani as its representatives in the joint commission with the United States.

A conference of Progressives at Indianapolis decides against the nomination of a candidate for President.

4.—A treaty between the United States and Denmark providing for the purchase of the Danish West Indies for $25,000,000 is signed at New York.

7.—Charles E. Hughes opens his campaign with a speech at Detroit, in which he assails the Administration's use of patronage.

8.—The Senate passes the Child Labor bill.

The four railroad brotherhoods announce a vote of 94 per cent. in favor of a national strike for the eight-hour day.

9.—The House adopts the conference report on the Army Appropriation bill.

The railroads refuse to grant the demands of the unions and call upon the Federal Board of Mediation and Conciliation to avert the threatened strike.

14.—President Wilson meets the representatives of the railways and of the unions in an effort to avert the threatened strike.

15.—The House approves the building

programme provided by the Senate in the Naval Appropriation bill.

16.—The Senate adopts the conference report on the Philippines bill, with the independence clause eliminated.

17.—President Wilson proposes a compromise agreement to avert the threatened railway strike which the railroad managers' committee rejects; he calls the presidents of the leading railroads in conference.

Sir Cecil Spring-Rice, the British Ambassador, issues a statement denying a report that the British mail censorship is being used to discover the trade secrets of American firms for use in capturing American trade.

18.—The Senate passes the Shipping bill.

The House passes the Child Labor bill as amended by the Senate.

President Wilson vetoes the Army Appropriation bill because of a clause exempting retired army officers from trial and punishment by court-martial.

The representatives of the four railroad brotherhoods accept President Wilson's proposed plan of settlement; the President meets the presidents of 31 railroads in conference.

19.—The Senate passes the Workmen's Compensation bill for Federal employees.

President Wilson issues a public statement of his recommendation that the eight-hour day be conceded to railroad workers, which the conference of railroad presidents rejects; the President summons 63 more presidents in conference.

21.—The railroad managers' committee again rejects President Wilson's compromise proposals to avert the threatened strike.

22.—The House passes the Army Appropriation bill amended to eliminate the clause exempting retired officers from trial and punishment by court-martial.

President Wilson announces the appointment of Franklin K. Lane, Secretary of the Interior, Judge George Gray of Wilmington, Del., and John R. Mott of New York as the three American members of the joint commission on Mexican relations.

The British, French, Russian and Japanese Governments address identic notes to the United States urging the exclusion of belligerent submarines from the rules regarding the admission of war vessels to neutral ports.

23.—The Senate repasses the Army Appropriation bill.

J. P. Morgan & Co. offer for public subscription an issue of $250,000,000 of two-year, five per cent. notes of the British Government; practically the whole issue is subscribed in two days.

24.—A protocol to the treaty between the United States and Haiti, arranging the details for the establishment of a native constabulary under American control, is signed at Washington.

27.—The 640 railroad union chairmen in conference at Washington are dismissed with sealed orders dated Aug. 14 for a nation-wide strike on the morning of Sept. 4.

28.—President Wilson is informed of the secret strike order and demands its revocation; the representatives of the four railroad unions refuse to rescind the order.

29.—President Wilson addresses the two houses of Congress in joint session on the subject of the threatened railroad strike; he recommends legislation establishing the eight-hour day as the legal basis for work and wages.

President Wilson signs the Army and Navy Appropriation Acts, the Philippines Act, and the Uniform Bill of Lading Act.

The U. S. armored cruiser *Memphis* is wrecked by a heavy sea in the harbor of Santo Domingo with a loss of 41 lives.

30.—The War Department orders General Funston to return to the state mobilization camps 12 regiments from the Mexican border.

31.—Mr. Adamson (Ga.) introduces in the House a bill drafted under President Wilson's supervision establishing the eight-hour day as the legal basis of work and wages for employees of common carriers after Jan. 1, 1917, and providing for a special commission to study and report on its effect.

The United States Government, replying to the identic notes of Great Britain, France, Russia and Japan, declares the existing rules of international law applicable to submarines.

Theodore Roosevelt delivers his first speech in the Republican campaign at Lewiston, Me., attacking President Wilson's Mexican and German policies.

SEPTEMBER

1.—The House passes the Eight-Hour bill.

President Wilson signs the Child Labor bill.

2.—The Senate passes the Eight-Hour bill; the representatives of the railway unions rescind their strike order.

The House passes the Webb bill permitting American exporters to combine for the purpose of establishing foreign selling agencies.

Woodrow Wilson is formally notified, at Long Branch, N. J., of his nomination as Democratic candidate for the Presidency and accepts in a speech defending the record of his administration.

3.—President Wilson signs the Eight-Hour Act.

5.—President Wilson signs the Eight-Hour Act a second time.

6.—The Senate passes the General Revenue bill with amendments retaliating against the British and French blacklists of American concerns.

The American-Mexican Joint Commission begins its sessions at New London, Conn.

7.—The Senate ratifies the treaty for the purchase of the Danish West Indies.

President Wilson signs the Shipping Act.

8.—The first session of the Sixty-fourth Congress is adjourned.

11.—State and Congressional elections in Maine result in the return of Republican legislature, governor, senators, and representatives.

23.—President Wilson defends the Eight-Hour Act in the opening speech of his campaign, at Long Branch, N. J.

25.—Charles E. Hughes, speaking at Dayton, O., declares that the Eight-Hour Act is essentially a measure regulating wages and not limiting hours.

30.—President Wilson in his second campaign speech at Long Branch, N. J., arraigns the leadership, campaign methods, and record of the Republican party.

OCTOBER

2.—The American-Mexican Joint Commission changes its place of meeting from New London to Atlantic City.

3.—Elections to the Philippine Senate results in the return of Nationalists in 19 of the 22 districts.

5.—President Wilson appoints Gen. George W. Goethals, Edgar E. Clark of the Interstate Commerce Commission, and George Rublee members of a board to investigate the effect of the Eight-Hour Act.

The War Department orders to the Mexican border all militia organizations still in state mobilization camps.

7.—The German submarine *U-53* enters Newport harbor.

9.—Charles E. Hughes, speaking in Philadelphia, pledges himself to protect American rights in life and property against foreign infringement.

10.—The British Government replies to the protest of the United States against the blacklisting of American concerns with a defense of its right to control the dealings of British subjects under municipal law.

12.—Sir Cecil Spring-Rice delivers the reply of the British and French Governments to the American protest of May 24 on the detention and seizure of neutral mails.

16.—The first session of the Philippine Congress created by the Philippines Act of Aug. 29 is opened at Manila.

22.—The Democratic National Committee issues a statement accusing Charles E. Hughes of having met and entered into a campaign compact with German and Irish propagandist leaders.

24.—Charles E. Hughes, speaking at New York, declares he wants the vote of no person whose allegiance is not single and complete.

26.—Woodrow Wilson, speaking at Cincinnati, declares that the present is the last great war in which the United States can remain neutral.

28.—The British steamer *Marina* is sunk without warning by a German submarine off the Irish coast; six American members of the crew lose their lives.

The American steamer *Lanas*, from Manila to Havre with rice, is sunk by a German submarine off the coast of Portugal; the crew is rescued.

The United States and Brazil exchange at Washington ratifications of a treaty of peace on the Bryan plan.

31.—Secretary Lansing instructs the American embassies in Berlin and London to obtain all available information on the sinking of the *Marina* by a German submarine.

Charles E. Hughes, speaking at Columbus, Ind., declares himself opposed to placing an embargo on the exportation of munitions of war or warning American citizens against travel on merchant vessels of belligerents.

NOVEMBER

1.—State-wide prohibition goes into effect in Virginia.

The German merchant submarine *Deutschland* arrives at New London, Conn., on her second voyage.

6.—The British passenger liner *Arabia*, with Americans on board, is sunk without warning by a submarine in the Mediterranean.

7.—Elections are held throughout the United States; Woodrow Wilson and Thomas R. Marshall are reëlected President and Vice-President by an electoral vote so close that the result is in doubt for two days; the Democrats gain an increased majority in the Senate but lose control of the House.

8.—Two naval lieutenants are killed by the premature explosion of a bomb during an aeroplane flight near Washington.

The American steamer *Columbian* is sunk by a German submarine off the Spanish coast after the escape of the crew.

10.—The General Education Board announces an endowment of $9,000,000 for the foundation of a medical school in the University of Chicago.

14.—It is announced in Washington that the United States Government has directed the American chargé d'affaires in Berlin to remonstrate informally to the German Government against the enforced deportation of Belgian workmen.

15.—Commercial wireless service is inaugurated between the United States and Japan.

16.—The War Department orders the return of 6,000 militia from the Mexican border.

21.—The American members of the Joint International Commission submit to the Mexican representatives a memorandum embodying the final proposals of the United States.

The American chargé d'affaires at Berlin presents to the German Government an inquiry as to the alleged sinking without warning of the *Arabia*, *Columbian*, *Lanas*, and two other steamers having Americans on board.

The German merchant submarine *Deutschland* sails from New London for Bremen.

22.—Judge Wm. C. Hook of the U. S. District Court at Kansas City, Mo., hands down a decree in an injunction suit of the Missouri, Oklahoma & Gulf Railroad declaring the Adamson Eight-Hour Act unconstitutional.

24.—A protocol is signed by the representatives of the United States and Mexico in the Joint International Commission providing for the withdrawal of the American punitive expedition within 40 days after ratification if conditions in northern Mexico warrant such action.

27.—The Federal Reserve Board issues a statement to member banks cautioning them against tying up their liquid assets in renewable short-term treasury notes of belligerent countries.

28.—The German Government replies to the American note of inquiry on the sinking of the *Marina* with a request for further evidence of the private character of the vessel.

The American steamer *Chemung* is sunk by an Austrian submarine in the Mediterranean near Valencia, Spain.

29.—The United States Government instructs the American chargé at Berlin to protest to the German Government against the deportation of Belgian civilians.

DECEMBER

1.—J. P. Morgan & Co. announce the withdrawal of an issue of short-term treasury notes of the British and French Governments.

4.—The second session of the Sixty-fourth Congress is opened.

Henry van Dyck, American Minister to the Netherlands, announces his resignation at The Hague; Thaddeus A. Thompson, Minister to Colombia, resigns.

The German Government admits that a German submarine sank the *Arabia* without warning, believing her to be a transport, and renews its pledges of reparation if evidence should prove the *Arabia* to have been an ordinary passenger vessel.

5.—President Wilson delivers his annual message in joint session of the two houses of Congress.

8.—The War Department announces that 6,000 additional militia have been ordered home from the Mexican border.

9.—John E. Osborne, Assistant Secretary of State, resigns.

The German Government replies to the inquiry of the United States on the sinking of the steamer *Lanas* that the vessel had been transferred from American to British registry and was sunk as a prize.

11.—The German Government replies to the representations of the United States on the deportation of Belgian civilians, admitting coercion but justifying deportation as the only remedy for idleness.

The U. S. transport *Sumner* goes ashore off Barnegat.

12.—The Senate adopts an amendment to the Immigration bill excluding Hindus and other unnamed Asiatics within certain geographical limits which exclude Japan.

14.—The Senate passes the Immigration bill with the clause prescribing a literacy test for immigrants.

Willard Saulsbury (Dem.) of Delaware is elected President *pro tempore* of the Senate.

The submarine *H-3* goes ashore on a shoal near Eureka, Cal.

15.—The U. S. Government receives a message from Villa offering to respect and protect the lives and property of foreigners in Mexico on condition of non-interference with his campaign by the American punitive force.

The British Government announces a decision to grant safe conduct to Count Tarnowski, Austro-Hungarian Ambassador to the United States.

18.—The Mexican members of the Joint International Commission report officially that Carranza has not signed the protocol pending the receipt of certain explanations.

General Funston under orders of the War Department designates 16,000 militia troops for return from the Mexican border.

President Wilson addresses a note to the belligerent nations suggesting an immediate declaration of their respective views as to the terms on which the war might be concluded and a durable peace established.

19.—The Senate defeats by a tie vote an amendment to the Sheppard Prohibition bill providing for a referendum on the establishment of prohibition in the District of Columbia.

The American members of the Joint International Commission inform the Mexican delegates that no changes in the protocol submitted to Carranza will be considered.

The German Government replies to the American inquiry on the sinking of the American steamer *Columbian*, justifying it on the ground that she had violated neutrality by using her wireless to disclose the presence of the submarine.

21.—The Senate Committee on the Judiciary reports favorably a resolution to submit an amendment to the Federal Constitution to establish nation-wide prohibition.

Secretary Lansing issues two statements explanatory of the President's peace note to the belligerent powers, the first declaring that the United States is drawing nearer the verge of war, the second denying that the Government contemplates any change in its policy of neutrality.

22.—Both houses of Congress adjourn to Jan. 2.

President Wilson nominates as members of the U. S. Shipping Board William Denman of San Francisco, Bernard N. Baker of Baltimore, John A. Donald of New York, John B. White of Kansas City, and Theodore Brent of New Orleans.

23.—A Federal board files a decision in the wage arbitration between the railroads and the Switchmen's Union awarding the switchmen an eight-hour day and wages on a nine-hour basis.

26.—The German Government replies to President Wilson's note, ignoring his suggestion for a definite statement of peace terms and proposing a conference of belligerents.

28.—Luis Cabrera, chairman of the Mexican delegation to the Joint Commission, transmits to Secretary Lane Carranza's second refusal to approve the protocol, with a further demand for its modification.

30.—The Spanish Government replies to President Wilson's note proposing a definition of peace terms, declining to support his initiative until a more opportune time.

FOREIGN CHRONOLOGY[1]

JANUARY

5.—Premier Asquith introduces in the British House of Commons a bill making all unmarried men between the ages of 18 and 41 in England, Scotland and Wales liable to compulsory military service.

6.—The British Labor Congress in session at London adopts resolutions opposing the Compulsory Service bill; Arthur Henderson, leader of the Labor party and President of the Board of Education, resigns from the Cabinet.

11.—John Redmond announces in the British House of Commons the withdrawal of opposition by the Irish Nationalists to the Compulsory Service bill.

12.—The British House of Commons passes the Compulsory Service bill on second reading; Arthur Henderson, leader of the Labor party, announces the withdrawal of his resignation from the Cabinet.

Alfredo Bazuerizo Moreno is elected President of Ecuador.

14.—Baron Chelmsford, former Governor of Queensland and of New South Wales, is appointed Viceroy of India, succeeding Viscount Hardinge.

18.—The German Reichstag adjourns to March 15.

22.—The Japanese Minister of Foreign Affairs announces that the Chinese Government has decided to postpone the establishment of a monarchy on account of internal conditions.

24.—The British House of Commons passes the Compulsory Service bill on third reading.

26.—The British House of Lords passes the Compulsory Service bill on third reading; a conference of trade unionists at Bristol adopts resolutions pledging support to the Government in the conduct of the war.

27.—The British Parliament is prorogued until Feb. 15; King George signs the Compulsory Service and Trading with the Enemy Acts and an act extending the life of the present Parliament for eight months.

FEBRUARY

1.—B. V. Stürmer is appointed Premier of Russia, succeeding Jean L. Goremykin, resigned.

3.—The Canadian Parliament building at Ottawa is destroyed by fire.

15.—The British Parliament reassembles.

The British Government issues orders-in-council prohibiting the importation after March 1 of tobacco, furniture, woods, wood pulp, etc., except under license from the Board of Trade; authorizing the requisition of materials required for military and naval purposes; and prohibiting voyages of British ships to foreign ports except under license.

22.—The Russian Duma is opened by Czar Nicholas in person.

23.—Lord Robert Cecil is appointed Minister of War Trade in the British Cabinet.

MARCH

4.—The Liberal and Conservative parties in Panama request the United States Government to supervise the Presidential election in July.

11.—The Portuguese Cabinet resign.

15.—The German Reichstag is opened.

The retirement of Adm. Alfred von Tirpitz and the appointment of Admiral von Capelle as German Minister of Marine are announced at Berlin.

16.—The resignation of Gen. Joseph S. Gallieni and the appointment of Gen. Charles Roques as French Minister of War are announced at Paris.

20.—Carranzist forces defeat Villa's band at Namiquipa, Chihuahua.

23.—Yuan Shih-kai issues a mandate abolishing the Chinese monarchy and restoring the republic, resuming himself the title of President.

26.—Costa Rica brings suit against Nicaragua in the Central American Court of Justice, alleging infringement of rights by the canal treaty with the United States.

29.—General Chouvaieff is appointed Russian Minister of War, succeeding General Polivanoff, resigned.

Gen. Kenichi Oshima becomes Minister of War of Japan, succeeding Gen. Ichinosuke Oka, resigned.

Villa and his band massacre the Carranzist garrison at Guerrero.

APRIL

5.—Gen. Paolo Morone becomes Minister of War in the Italian Cabinet, succeeding General Zupelli.

6.—General Obregon is appointed Minister of War in the Mexican Government.

7.—A convention between Germany and Rumania restoring ordinary commercial relations, is signed at Berlin.

10.—Five members of the Greek Cabinet resign.

21.—A German naval auxiliary disguised as a neutral ship and convoyed by a submarine is sunk in an attempt to land arms and ammunition on the coast of Ireland; Sir Roger Casement is taken prisoner by the British.

Yuan Shih-kai creates a new Cabinet for China with Tuan Chi-jui as Premier and Minister of War.

24.—A rebellion organized by the Sinn Fein breaks out in Dublin; the "Provisional Government of the Republic of Ireland" proclaims the independence of Ireland; the rebels seize the Post Office and other buildings and cut telephone and telegraph communications.

27.—The Irish rebellion spreads to the west and south; martial law is proclaimed throughout the island.

29.—The Dublin Post Office, the chief

[1] Exclusive of the chronology of the European War, which is separately recorded in the following section.

stronghold of the Sinn Fein rebels, is burned.

30.—The "Provisional Government of the Irish Republic" recommends the unconditional surrender of all the Irish rebels; the main body of insurgents in Dublin surrenders.

MAY

1.—President Juan I. Jiminez of the Dominican Republic is impeached by the Chamber of Deputies for irregularities in connection with the budget.

2.—Augustine Birrell, Chief Secretary for Ireland in the British Cabinet, resigns.

3.—The British House of Commons passes on first reading a bill providing for immediate general compulsory military service of all male citizens for the duration of the war.

The four principal leaders of the Irish rebellion are executed in London.

4.—Four more Irish rebel leaders are executed in London.

The Haitian Cabinet resigns.

5.—A rebellion against President Jiminez of the Dominican Republic begins in Santo Domingo; American marines are landed from the cruiser *Prairie*.

7.—Juan I. Jiminez, President of the Dominican Republic, resigns to prevent armed intervention threatened by the American Minister.

10.—The resignation of Baron Wimborne, Lord Lieutenant of Ireland, is announced at London; a commission headed by Baron Hardinge is appointed to investigate the causes of the Irish revolt.

11.—Li Yuan-hung is proclaimed President of South China by a provisional revolutionary government.

12.—The last two signers of the Irish proclamation of independence are executed in Dublin.

13.—Dr. Hans Delbrück, German Minister of the Interior, resigns under criticism of his handling of the problem of food shortage.

16.—The British House of Commons passes on third reading the Compulsory Military Service bill.

17.—The Dominican Chamber of Deputies elects Federico H. Carvajal provisional president of the Dominican Republic.

18.—Rumania concludes with Austria-Hungary a commercial treaty similar to that with Germany.

22.—Karl Helfferich is appointed Minister of the Interior and Vice-Chancellor in the German Cabinet, and is succeeded as Secretary of the Imperial Treasury by Count von Rödern.

23.—Tortilowitz von Batocki is appointed head of a new German War Food Department.

25.—The British Compulsory Military Service bill is signed by King George.

29.—The British House of Commons adopts a resolution imposing an additional income tax on American securities not deposited with the Treasury.

31.—Sir Ernest Shackleton arrives at Port Stanley, Falkland Islands, with five companions in a small boat, his ship having been lost in the Antarctic.

JUNE

1.—American marines are landed at Monte Christi and Puerta Plata, Dominican Republic; one captain of marines is killed.

6.—Yuan Shih-kai, President of the Chinese Republic, dies at Peking; Li Yuan-hung, Vice-President, succeeds to the Presidency.

9.—The Italian Chamber of Deputies rejects the budget.

The revolted Chinese provinces rescind their declarations of independence.

10.—The Italian Chamber of Deputies refuses a vote of confidence in the Ministry demanded by Premier Salandra.

11.—Premier Salandra of Italy and his Cabinet resign.

12.—Hipolito Irigoyen is elected President of Argentina.

14.—The Senate of the Dominican Republic elects Jacinto de Castro to the Presidency.

17.—Paolo Boselli, appointed Premier of Italy, completes a Cabinet, with Baron Sonnino as Minister of Foreign Affairs.

20.—Premier Skouloudis of Greece and his Cabinet resign; M. Zaimis is invited to form a Ministry.

23.—Premier Zaimis of Greece completes a new Ministry, assuming himself the portfolio of Foreign Affairs.

Premier Tuan Chi-jui of China and his Cabinet resign.

27.—It is announced in London that the Duke of Devonshire will succeed the Duke of Connaught as Governor-General of Canada.

28.—Karl Liebknecht, German Socialist leader, is dismissed from the army and sentenced to 30 months' penal servitude for attempted high treason.

29.—Sir Roger Casement is convicted of high treason by a jury in London and sentenced to death by hanging.

30.—The Russian Duma passes a measure prohibiting permanently the sale of intoxicants containing more than 1½ per cent. of alcohol.

A new Chinese Cabinet is formed with Tuan Chi-jui as Premier.

JULY

1.—An engagement occurs between American marines and natives in the interior of the Dominican Republic, with one American and 27 Dominicans killed.

2.—The Russian Duma adopts a bill extending to peasants the same civil rights enjoyed by other classes.

3.—The British Royal Commission appointed to investigate the Irish rebellion reports that the primary responsibility lies with Augustine Birrell, former Chief Secretary for Ireland.

The Russian Duma is prorogued until Nov. 14.

A treaty between Russia and Japan for mutual protection and defense of their interests in the Far East is signed at Petrograd.

6.—David Lloyd George is appointed Secretary of State for War in the British Cabinet.

9.—Edwin Samuel Montagu is ap-

pointed Minister of Munitions in the British Cabinet.

Ramon M. Valdes is elected President of Panama.

10.—The New Zealand House of Representatives passes a bill providing for compulsory military service.

11.—Lord Lansdowne outlines in the British House of Lords a plan for the provisional government of Ireland pending the establishment of a new government.

21.—The Canadian commission appointed to investigate scandals in munitions contracts issues its report exonerating Sir Sam Hughes.

22.—Sergius Sazonoff, Russian Minister of Foreign Affairs, resigns; Boris Vladimirovitch Stürmer, the Premier, assumes the portfolio.

26.—Federico Henriques Carvajal is proclaimed Provisional President of the Dominican Republic.

31.—Henry Edward Duke is appointed Chief Secretary for Ireland in the British Cabinet.

AUGUST

1.—The Chinese Parliament assembles; Li Yuan-hung takes the oath as President.

3.—Sir Roger Casement is executed by hanging in London.

6.—Baron Wimborne is reappointed Lord Lieutenant of Ireland.

Great Britain, Russia and Persia conclude a treaty on Persian financial and military organization and foreign relations.

13.—An armed clash occurs between the Chinese and Japanese troops at Cheng-Chiatun, near Mukden.

14.—The Danish Folkething votes in favor of selling the Danish West Indies to the United States with the approval of the electorate at a referendum.

19.—The Chinese Government announces a protest to Japan against the sending of 2,000 Japanese troops to Eastern Mongolia because of the recent clash at Cheng-Chiatun.

23.—The British Parliament adopts a bill extending the life of the present Parliament another seven months and adjourns to Oct. 10.

Karl Liebknecht, the German Socialist leader, appealing against his conviction for war treason, is sentenced by a court-martial to a new and severer penalty of 49 months' penal servitude and expulsion from the army.

The German merchant submarine *Deutschland* arrives at the mouth of the Weser.

25.—The Danish Landsthing adopts a decree that the sale of the Danish West Indies be postponed until after the war, or if this be impossible, that it be settled by a general election.

SEPTEMBER

1.—The German Government opens to subscription its fifth war loan.

3.—Japan presents to the Chinese Government demands for certain rights in inner Mongolia in satisfaction for the clash between Chinese and Japanese troops at Cheng-Chiatun.

Sir Ernest Shackleton reaches Punta Arenas, Chile, with 22 members of his Antarctic expedition marooned on Elephant Island.

11.—The center span of the Quebec Bridge over the St. Lawrence collapses during construction, with a loss of 11 lives.

13.—Premier Zaimis of Greece and his Cabinet resign.

16.—Nikolas Kalogeropoulos accepts the Premiership of Greece and forms a Cabinet.

27.—Eleutherios Venizelos and Admiral Goundouriotis of the Greek Navy issue at Canea a proclamation of a provisional government for Crete.

28.—The German Reichstag is opened; the Chancellor, von Bethmann-Hollweg, emphasizes the futility of discussing terms of peace.

29.—Lidj Jeassu, Emperor of Abyssinia, is reported deposed by his aunt, Ouizero-Zeoditu, who is proclaimed Empress.

30.—Both houses of the Danish Parliament pass a bill for a plebiscite on the sale of the Danish West Indies to the United States.

President Carranza of Mexico issues a decree abolishing the office of Vice-President, reducing the term of President from six to four years, and prohibiting election of a President for two consecutive terms.

Chios, the last of the loyal Greek islands, declares in favor of the Venizelist rational defense movement.

The Chinese Government contracts with an American corporation for the construction of 1,100 miles of railroads at a price of over $60,000,000.

OCTOBER

1.—Emiliano Chamorro is elected President of Nicaragua.

3.—Premier Kalogeropoulos of Greece and his Cabinet resign.

Count Okuma, Premier of Japan, and his Cabinet resign.

4.—Gen. Count Seiki Teranchi becomes Premier of Japan.

8.—Spyridon P. Lambros is appointed Premier of Greece and forms a Cabinet.

14.—King Constantine of Greece signs a decree postponing for a month the meeting of the Chamber of Deputies.

Japan and Russia protest to the Chinese Government against contracts with Americans for railroad and canal construction.

16.—The consuls of the Entente powers in Crete recognize the provisional government of M. Venizelos.

21.—Count Karl Stuergkh, Premier of Austria, is assassinated by a political opponent in Vienna.

27.—Dr. Ernst von Koerber is appointed Premier of Austria.

28.—The voters of Australia in a special election reject a proposal to establish compulsory military service for the duration of the war.

30.—General von Stein is appointed

Minister of War in the German Cabinet, succeeding Gen. Wild von Hohenborn.

Gen. Feng Kwo-chang is elected Vice-President of the Chinese Republic.

31.—Parral, Chihuahua, is captured by a Villista force.

NOVEMBER

1.—A general election is held in Cuba with indecisive results.

Sir George Perley is appointed Overseas Minister of Militia for Canada.

2.—The Turkish Government publishes a note to Germany and Austria-Hungary, repudiating the Treaty of Paris of 1856 and the Treaty of Paris of 1878 and announcing her complete independence of the guardianship of the Great Powers.

7.—Wu Ting-fang is appointed Minister of Foreign Affairs in the Chinese Cabinet.

11.—The Duke of Devonshire arrives at Halifax and takes the oath of office as Governor-General of Canada.

13.—Gen. Sir Sam Hughes resigns as Minister of Militia and Defense in the Canadian Cabinet.

17.—The British Government issues an order-in-council giving the Board of Trade wide powers over the supply, consumption and price of foodstuffs.

21.—Emperor Franz Josef of Austria-Hungary dies at Schönbrunn Castle, Vienna; he is succeeded by his grandnephew, Archduke Karl Franz Joseph.

Gottlieb von Jagow, German Minister of Foreign Affairs, resigns.

23.—Albert E. Kemp succeeds Gen. Sir Sam Hughes as Minister of Militia of Canada.

24.—Alexander Trepoff is appointed Premier of Russia, succeeding Boris Stürmer.

25.—Alfred Zimmermann is appointed German Secretary of Foreign Affairs.

M. Neratoff, Assistant Minister, is appointed Russian Minister of Foreign Affairs, succeeding M. Stürmer.

27.—Villa captures Chihuahua, the Carranza forces withdrawing to the north.

29.—Capt. Harry S. Knapp, commanding the American naval and marine force of occupation in the Dominican Republic, proclaims military government for the Republic.

The British Board of Trade announces that from Dec. 1 it will assume control of the South Wales coal mines.

30.—Chancellor von Bethmann-Hollweg introduces in the German Reichstag a Man Power bill empowering the Government to draft the services in munitions manufacture of all unemployed able-bodied males.

DECEMBER

1.—A Constitutional Congress is opened by General Carranza at Queretaro, Mexico.

2.—The German Reichstag passes the bill providing for compulsory civilian service.

Villa evacuates Chihuahua after a severe defeat of his forces by Carranza troops south of the city.

5.—Herbert H. Asquith resigns as Prime Minister of the United Kingdom; the King offers the post to Andrew Bonar Law.

The British Board of Trade issues regulations limiting the number of courses which may be served at meals in public places.

6.—David Lloyd George accepts the Premiership of the United Kingdom, the post being declined by Bonar Law.

Carranzist forces recapture Parral, Chihuahua, from the Villistas.

7.—The French Chamber of Deputies, after a number of secret sessions, adopts by a vote of 344 to 160 a resolution of confidence in the Government in its conduct of the war.

10.—David Lloyd George announces the completion of his Cabinet and the constitution of a war council of five members.

The German merchant submarine *Deutschland* arrives at Bremen.

12.—Premier Briand of France announces the formation of a new Cabinet, with a special war council of five members, and the appointment of Gen. Robert Georges Nivelle as commander-in-chief of the French armies.

13.—The French Chamber of Deputies adopts a resolution of confidence in the new Government.

The Austrian Cabinet headed by Dr. Ernst von Koerber resign.

The selection of Archduke Charles Stephen of Austria to be regent of Poland is announced at Warsaw.

14.—A plebiscite in Denmark on the sale of the Danish West Indies to the United States results in a large majority in favor of the sale.

Edmund Schulthess of Aargau is elected President of Switzerland.

21.—Count Henry Clam-Martiniz, Premier of Austria, completes a Cabinet.

22.—King Christian of Denmark ratifies the treaty providing for the sale of the Danish West Indies to the United States.

King George, proroguing the British Parliament to Feb. 7, 1917, declares that the war must continue until the rights violated by Germany are vindicated.

23.—Count Czernin von Chudenitz is appointed Minister of Foreign Affairs in the Austro-Hungarian Cabinet, succeeding Baron Burian, who is appointed Minister of Finance.

The French Government publishes a decree permitting the Government alone to charter shipping and announcing arrangements for convoy by war vessels of shipping employed in the transport of foodstuffs and coal.

A force of Villistas occupy Torreon.

24.—Villistas capture San Pedro de las Colonias, northeast of Torreon.

25.—Villistas capture San Luis Potosi, southeast of Torreon.

28.—General Krobatin, Austrian Minister of War, resigns and is succeeded by Marshal von Schleier.

30.—Charles II is crowned King of Hungary at Budapest.

CHRONOLOGY OF THE EUROPEAN WAR[1]

JANUARY

6.—The Russians capture Czartorysk, east of Kovel.

The Austrians resume the offensive in Montenegro.

8.—The British and French forces evacuate without loss their remaining positions on Gallipoli Peninsula, at Cape Helles.

9.—The Germans in Champagne attack heavily on a five-mile front between La Courtine and Mont Tetu without success.

A British relief force approaching Kut-el-Amara defeats the Turks in a heavy engagement at Sheik Saad.

The British Admiralty reports the sinking of the battleship *King Edward VII* by a mine.

10.—The Austrians capture Mount Lovcen, Montenegro, and occupy Berane.

11.—The Russians begin a general offensive on a 100-mile front in the Caucasus.

A French force lands on the Greek island of Corfu to prepare a refuge for the Serbian army; the Greek Government protests against the occupation.

12.—The Austrians in Montenegro occupy the seaport of Budua.

The French before Saloniki destroy the railroad bridges over the Struma at Demir-Hissar and Kilindir.

13.—The Austrians occupy Cettinje, capital of Montenegro; Montenegro requests an armistice for the negotiation of terms of peace.

The British relief force on the Tigris repulses the Turks at Oeah.

An Austrian cruiser of the *Novara* type is sunk by a French submarine in the Adriatic.

15.—The British liner *Appam* is captured by the German auxiliary cruiser *Möwe* off the Canary Islands.

16.—The Montenegrin Government accepts unconditional surrender of arms as a condition precedent to peace negotiations.

19.—The Montenegrin Government rejects peace terms offered by Austria and resumes hostilities.

Gen. Sir Percy Lake assumes supreme command of the British forces in Mesopotamia.

20.—The Russians in the Caucasus occupy Hassan Kale, east of Erzerum.

21.—The Turks check the British relief force at Menlarie, 23 miles below Kut-el-Amara.

The British House of Commons authorizes an addition of 50,000 men to the navy personnel.

22.—The Austrians occupy the Montenegrin Adriatic seaports of Antivari and Dulcigno.

23.—The Austrians occupy Scutari, Albania.

German aeroplanes make two raids on the east coast of Kent, killing one person.

28.—The Germans capture Frise, south of the Somme, and advance on a mile front northeast of Neuville.

The Austrians in Montenegro occupy Alessio and San Giovanni di Medua.

Allied forces occupy the fort of Kara Burun, commanding the harbor of Saloniki.

29.—A German Zeppelin bombards Paris, killing 24 persons and injuring 30.

31.—German Zeppelins raid the eastern, northeastern and midland counties of England, killing 54 persons.

FEBRUARY

2.—The German Zeppelin *L-19* is disabled and sinks in the North Sea.

6.—The Spanish Government announces the internment in Spanish Guinea of 14,000 German troops from Kamerun.

8.—The French cruiser *Amiral Charner* is sunk by a German submarine off the Syrian coast.

9.—The Russians capture Uscieczko, on the Dniester.

Gen. Jan Christian Smuts assumes command of the British forces in German East Africa.

10.—The British Compulsory Service Act goes into effect.

11.—The German and Austro-Hungarian Governments issue a memorandum to neutral powers declaring their intention of treating after Feb. 29 all armed enemy merchant vessels as auxiliary cruisers liable to be sunk without warning.

14.—The Allied powers jointly pledge themselves to the Belgian Government to continue hostilities until Belgium is restored to independence.

The Germans attack heavily east of Ypres and carry 600 yards of trenches.

The British cruiser *Arethusa* is reported sunk by a mine off the east coast of England.

16.—The Russians capture Erzerum, taking 13,000 prisoners and much war material.

18.—The Swedish Government instructs its representatives to warn Swedish subjects against travel on armed vessels of belligerent countries.

19.—The Russian War Office announces the capture of Mush and Ahlat.

The British War Office announces the conquest of Kamerun.

20.—Four German seaplanes bombard Lowestoft and Walmer, England, killing three persons.

21.—The Germans begin an assault on Verdun; they capture Haumont and a French salient near Beaumont.

The British House of Commons votes war credits to the amount of $2,100,000,000.

22.—The Italian War Office announces the occupation of Runchi and Roncegno, in the Trentino.

Vice-Adm. Reinhardt Scheer is appointed to the command of the German battle fleet, succeeding Admiral von Pohl.

[1] Events affecting the relations of the United States with the belligerents are recorded under *American Chronology, supra.*

23.—The Germans before Verdun attack on a six-mile front between Brabant-sur-Meuse and Ornes; they penetrate the French lines two miles at some points, capture Brabant, Samogneux and Beaumont, and take 3,000 prisoners.

Portuguese naval officers take forcible possession of 36 German and Austrian vessels lying in the Tagus River.

24.—The Germans north of Verdun capture Marmont, Chambrettes, and Ornes.

The Russians in the Caucasus capture Isphir.

The Earl of Derby is appointed chairman of a joint military and naval board to control the British air service.

25.—The Germans storm Fort de Douaumont, northeast of Verdun.

26.—The Germans lose and recapture Fort de Douaumont; westward they capture Champneuville, the Côte de Talou, and Hardaumont Wood.

The French auxiliary cruiser *Provence II* is sunk in the Mediterranean, with a loss of 3,130 lives.

Gen. Alexci Kuropatkin is appointed to the command of the Russian forces on the northern front.

27.—The Germans in Champagne capture French positions on a mile front north of Souain.

The Austrians occupy Durazzo, Albania,

The British P. & O. liner *Maloja* is sunk by a mine two miles off Dover, with a loss of 155 lives.

28.—The Germans east of Verdun capture Dieppe, Abaucourt and Blanzée, and farther south, Manhuelles and Champlon.

29.—The German auxiliary cruiser *Greif* and the British auxiliary cruiser *Aleantara* are sunk in an engagement in the North Sea.

The requisition of 34 German steamships by the Italian Government is announced in the British House of Commons.

MARCH

1.—Germany presents an ultimatum to Portugal demanding release of seized German ships within 48 hours.

2.—The Russians in Armenia capture Bitlis.

4.—The Germans north of Verdun enter the village of Douaumont.

The Russians, attacking from the sea, capture Atina, on the Black Sea coast east of Trebizond.

5.—German Zeppelins raid the northeast coast of England, killing 13 persons.

The German cruiser *Möwe* reaches a home port after a cruise of several months in the South Atlantic, during which she captured 15 vessels.

6.—The Germans northwest of Verdun capture Forges.

7.—The Germans southeast of Verdun capture Fresnes.

The Russians in Armenia capture the Black Sea port of Rizeh.

8.—The Germans northwest of Verdun capture Regnéville, on the Meuse.

9.—Germany declares war on Portugal.

10.—The Germans northwest of Verdun recapture the Bois des Corbeaux.

13.—The British in German East Africa occupy Mushi.

14.—The British reoccupy the Egyptian port of Sollum, on the Tripoli frontier.

15.—Austria declares war on Portugal.

18.—The French torpedo boat *Renaudin* is sunk by a submarine in the Adriatic.

19.—The Russians capture the bridgehead northwest of Uscieczko, on the Dniester.

The Russians in Persia occupy Ispahan.

German aeroplanes raid the east coast of Kent, killing nine persons; one aeroplane is brought down at sea.

20.—The Germans attack heavily between Malancourt and Avocourt, west of the Meuse, and capture the Avocourt Wood.

British forces in German East Africa occupy Arusha.

21.—The Russians take the offensive on the northern front and advance near Jacobstadt, near Mischkele, and southwest of Lake Narocz.

22.—The Germans northwest of Verdun capture Haucourt hill, south of Malancourt.

The Russians capture Latachka-Melevka, on the Dniester.

The British transport *Minneapolis* is sunk by a submarine in the Mediterranean.

24.—The French channel steamer *Sussex*, with many American citizens on board, is sunk without warning by a German submarine off Dieppe, with a loss of about 50 lives; all the Americans are saved.

27.—The British capture two lines of German trenches on a front of 600 yards at St. Eloi, south of Ypres.

Representatives of the eight Entente Allies meet in conference in Paris.

30.—The British Government issues an order-in-council extending the doctrine of continuous transport to conditional contraband.

The Russian hospital ship *Portugal* is sunk by a Turkish submarine in the Black Sea.

31.—The Germans northwest of Verdun capture Malancourt; northeast they penetrate the village of Vaux.

German Zeppelins raid the east coast of England, killing 28 persons; one Zeppelin is brought down off the mouth of the Thames.

APRIL

1.—A German Zeppelin raids the northeast coast of England, killing 16 persons.

2.—The Germans northeast of Verdun penetrate Caillette Wood and complete the capture of the village of Vaux.

German Zeppelins raid the coast of Scotland and the northern and southeastern counties of England, killing 10 persons; a Zeppelin bombards Dunkirk, France, killing two persons.

3.—The French before Verdun again enter the village of Vaux and recover most of Caillette Wood.

4.—General Brusiloff assumes command of the Russian forces in Volhynia and Galicia, succeeding General Ivanoff.

5.—The British relief force on the Tigris captures Felahie.

6.—The Germans northwest of Verdun capture Haucourt.

8.—The French northwest of Verdun evacuate Bethincourt and straighten their line between Avocourt and Cumières.

12.—The British forces in German East Africa capture Umbugwe.

14.—The British forces in German East Africa capture Salanga.

18.—The Russians capture the Turkish Black Sea port of Trebizond.

19.—British forces occupy Kondoa, German East Africa.

20.—A force of Russian troops is landed at Marseilles for service on the western front.

23.—A large force of Turks occupy Quatia, Egypt, 25 miles east of the Suez Canal; another force is repulsed at Dueidar.

24.—British aeroplanes destroy the Turkish camp near Quatia, Egypt.

25.—A German naval squadron accompanied by Zeppelins is routed by British sea and air forces after a brief bombardment of Yarmouth and Lowestoft, in which four persons are killed; the British submarine *E-22* is sunk; German Zeppelins later raid Norfolk and Suffolk.

27.—The British battleship *Russell* is sunk by a mine in the Mediterranean, with a loss of 124 lives.

A German submarine is sunk by British warships off the east coast of England and the crew captured.

28.—The Germans recover positions taken by the Russians southwest of Lake Narocz.

29.—The British force of 9,000 men under General Townshend besieged in Kut-el-Amara surrenders to the Turks.

MAY

2.—General von Bissing, military governor of Belgium, issues a proclamation reserving to the German authorities the right to supply work to the idle and prohibiting under heavy penalties the ordering or execution of work not approved by them.

3.—A German Zeppelin raids Deal, England.

A German Zeppelin is wrecked near Stavanger, on the Norwegian coast.

An Austrian torpedo boat is sunk by a French submarine in the Adriatic.

A German Zeppelin is destroyed by British warships off the German coast.

8.—The Turks repulse the Russians on a ten-mile front near Mount Kope.

Belgian forces occupy Kigali, German East Africa.

The White Star liner *Cymric* is torpedoed without warning off the coast of Ireland and sinks the following day.

9.—An Austrian transport is sunk by a French submarine in the Adriatic.

15.—The Austrians attack on a front of 23 miles between the valleys of the Adige and Astico and penetrate the Italian front at several points, taking over 2,000 prisoners.

The British gain the crest of Vimy ridge on a narrow front.

General von Bissing, military governor of Belgium, issues a proclamation prescribing confinement or coercive labor for idle Belgians declining without adequate reason to accept work prescribed by the German authorities.

16.—The Austrians in the Tyrol capture Moschere.

17.—The British Government announces the appointment of an Aerial Service Board under the presidency of Earl Curzon.

Three German steamers are sunk by British and Russian submarines in the Baltic.

18.—The Austrians capture Campomlon, Toraro, Zugnatorta and Costabella, and repulse the Italians on a five-mile front between Monte Maggio and Sagliodaspio.

19.—The Austrians capture the Santo ridge, southeast of Rovereto, and occupy Roncegno, Sasioalto and Tonessa, east of Campomlon.

20.—A force of Russian cavalry joins the British army on the Tigris.

21.—The French before Verdun capture the Haudromont quarries and advance between Esnes and Haucourt.

The Germans capture British trenches on a mile front on Vimy Ridge, south of Givenchy.

The Austrians in Tyrol capture Fima, Mandriolo and the Lavarone Plateau.

22.—The French before Verdun advance on a mile front east of the Meuse and penetrate Fort de Douaumont.

The Austrians in Tyrol cross the Italian frontier and capture Monte Velna.

23.—The British House of Commons votes a war credit of $1,500,000,000.

24.—The Germans north of Verdun recapture the whole of Fort de Douaumont; west of the Meuse they capture Cumières.

25.—The Austrians in Tyrol capture Civaron.

26.—The French before Verdun again penetrate Cumières.

The Austrians in the Trentino capture Batalo, Monte Cimone, and the mountain ridge between Cornocicampe Verde and Maata.

The Bulgarians invade Greece and occupy the Forts Rupel, Kanivo and Dragotin, on the Struma near Demir-Hissar.

27.—The Austrians capture Cornovo, Italy, west of Arsiero.

30.—The Austrians in the Trentino cross the Posina and capture Punta Cordin and Monte Priafora; northeast of Asiago they capture Gallio, Monte Baldo, and Monte Fiara.

The British occupy Neu Langenberg, German East Africa.

31.—The British and German fleets are engaged in a great naval battle off the coast of Jutland; the British lose three battle cruisers, three cruisers, and eight destroyers; the Germans lose three battleships, three battle cruisers, five light cruisers, six destroyers, and a submarine.

JUNE

1.—The Germans northeast of Verdun capture Caillette Wood, between Fort de Douaumont and Vaux.

3.—The Austrians advance east of Monte Cengio and capture Ceisana.

4.—The Russians assume the offensive from the Pripet to the Rumanian frontier, gain at many points, and take 13,000 prisoners.

5.—The British cruiser *Hampshire* is sunk off the West Orkney Islands; Earl Kitchener, British War Secretary, and his staff, *en route* to Russia, perish.

6.—The Germans northeast of Verdun capture Fort de Vaux; in Flanders they capture Hooge.

The Russians recapture the fortress of Lutsk.

7.—The Italians capture four passes in the Val Tellina, northwest of Trent.

The German Reichstag approves a war credit of $3,000,000,000.

8.—King Constantine of Greece signs a decree for the demobilization of half the Greek army.

9.—The Italian transport *Principe Umberto* is reported sunk by Austrian submarines in the Adriatic.

10.—The Russians capture the fortress of Dubno and Buczacz and Scianka, Galicia, taking 35,000 prisoners.

11.—The Entente Allies present a joint note to the Greek Government making further demands as a condition of raising the economic blockade.

12.—The Russians capture Torchin, west of Lutsk, Zarvanitza, on the Stripa, and Zale Szczyky and Horodenka, northwest of Czernowitz.

13.—The Russians capture Demidovka and Kozin, west of Dubno, and Sniatyn, northwest of Czernowitz.

14.—The German auxiliary cruiser *Herzmann* and several merchant vessels under her convoy are sunk by Russian destroyers in the Baltic.

Representatives of the Entente Allies meet in Paris in conference on economic measures to be taken during and after the war.

15.—The Russians repulse the Austrians on the Stripa between Gouvoronka and Guilovody, taking 14,000 prisoners.

16.—The Russians capture Potchaieff, Staryi Movyi, and Radziviloff, northeast of Lemberg, and Svidniks on the Stokhod.

The Italians capture Malga, Fossetta, Monte Magari and other positions between the Frenzela Valley and Marcesina.

17.—The Russians cross the Pruth and capture Czernowitz, capital of Bukowina.

The economic conference of the Entente Allies at Paris adjourns after adopting resolutions on trade relations after the war.

19.—The Russians in Bukowina capture Zadova, Strojinetz and Gliboka.

21.—The Russians pursuing the Austrians in Bukowina occupy Radautz.

Great Britain, France and Russia present a joint note to the Greek Government, demanding demobilization of the army, the formation of a non-partisan Cabinet, the dissolution of the Chamber and a new election, and the removal of certain police officers; Premier Skouloudis and his Cabinet resign and M. Zaimis is invited to form a Ministry.

22.—An uprising of Arab tribes in Arabia against the Turks, with the capture of Mecca, Taif and the port of Jeddah, is reported from Cairo.

23.—The Germans before Verdun attack on a wide front east of the Meuse, capture the Thiaumont work and penetrate the village of Fleury; they are driven from the latter by a counter-attack.

The Russians complete the conquest of Bukowina with the capture of Kimpolung; they cross the Rybnitza into Galicia and occupy Kuty but are driven out by the Austrians.

The Greek Government accepts without reserve the demands of the Allied Powers.

The Italian auxiliary cruiser *Citta di Messina* and the French destroyer *Fourche* are sunk by an Austrian submarine in the Strait of Otranto.

24.—The Germans before Verdun reoccupy a part of the village of Fleury; the French recapture much of the ground lost near Thiaumont.

26.—The Italians capture Posina, Arsiero and other villages on the Trentino front.

27.—The British begin a bombardment of the German positions along the whole front from the Yser to the Somme.

King Constantine of Greece signs a decree for the demobilization of the remainder of the army.

28.—The Russians inflict a severe defeat upon the Austrians between the Dniester and the Pruth, capturing three lines of trenches and taking several thousand prisoners.

The Italians storm Fort Mattassone and Monte Trappola in the Val Arsa and Pedescala in the Astico valley.

29.—The Russians capture Obertyn, Galicia.

30.—The French twice capture and lose the Thiaumont work, northeast of Verdun.

The Russians capture Kolomea, Galicia, and force a retirement of the Austrians on a wide front.

The Russians in the Caucasus evacuate Mamakhatum before a Turkish flanking movement.

JULY

1.—The British and French attack on a front of about 25 miles north and south of the River Somme; the British carry seven miles of German first-line trenches and capture Montauban and Mametz; the French capture Dompierre, Becquincourt and Fay.

The French storm and hold the Thiaumont work, northeast of Verdun.

2.—The French penetrate the second line of German trenches at several places south of the Somme and capture Frise and Curlu; the British capture Fricourt.

3.—The French capture the German second-line positions of Herbecourt, Assevillers and Feuillères, south of the Somme, and push their advance beyond Buscourt and Flaucourt; the British capture La Boisselle.

The French lose and recapture the Damloup work, east of Verdun.

4.—The French capture Barleux, Bel-

loy-en-Santerre, and the greater part of Estrées, south of the Somme.

The Germans again capture the Thiaumont work, northeast of Verdun.

5.—The French storm German second-line positions on a mile front north of the Somme and capture Hem and the remainder of Estrées.

The Russians repulse the Austro-Germans on the Stye, north of Kolki, and on the lower Stripa and Dniester, taking 10,000 prisoners; they capture Sadouska, west of Kolomea, and cut the Delatyn-Korosmezo railroad.

7.—The British gain at several points near La Boisselle and Fricourt and capture and lose Contalmaison.

The Russians capture Gruziatyn, on the lower Styr.

8.—The French capture Hardecourt and Mamelon, north of the Somme; the British penetrate Trones Wood.

The Russians occupy the railway junction of Delatyn, southern Galicia.

The British and French Governments issue an order-in-council withdrawing all orders previously made under the Declaration of London and restoring the old law of blockade and contraband.

9.—The French capture Biaches, across the Somme from Peronne.

The Russian War Office reports the sinking of the hospital ship *Vperiode* without warning by a submarine in the Black Sea.

10.—The French capture Hill 97, southeast of Biaches; the British penetrate Mametz Wood and capture Contalmaison.

The British War Office reports the capture of Tanga, German East Africa.

14.—The British penetrate the German second line north of the Somme on a front of four miles, using cavalry for the first time since the deadlock of 1914.

15.—The British capture Delville Wood, northeast of Longueval, reach Pozières, and penetrate the German third-line in Faureaux Wood.

The Russians storm Baiburt, between Trebizond and Erzerum.

A British force captures Muanza, on Lake Victoria, German East Africa.

16.—The British complete the capture of Ovillers-la-Boisselle.

The French lose and recover La Maisonette and Biaches, south of the Somme.

The Russians repulse the Austro-Germans across the Lipa near Sviniusky, southwest of Lutsk, taking 13,000 prisoners and many guns.

17.—A contingent of Russian troops for the western front is disembarked at Brest.

18.—The Germans by heavy counter-attacks regain from the British the village of Longueval and part of Delville Wood.

The British Government issues a blacklist under the Trading with the Enemy Act containing the names of over 82 American concerns.

19.—The British recapture Longueval.

20.—The French capture the German first-line positions south of the Somme between Estrées and Vermandovillers; the British capture Foureaux Wood, north of Longueval, but lose part of it to a German counter-attack.

21.—The Italian Government issues a decree declaring that allies of Austria are to be treated as enemies and their subjects and their property liable to sequestration.

23.—The British attack on the four-mile front between Pozières and Guillemont and capture part of Pozières.

24.—The Italians capture Monte Cimone.

25.—The British complete the occupation of Pozières.

The Russians capture Erzingan, the last Turkish stronghold in Armenia.

26.—The German Government issues a revision of the prize law greatly extending the list of absolute contraband.

27.—The Russians break through the first line of Austro-German positions west of Lutsk, taking 9,000 prisoners.

28.—The British complete the capture of Longueval and Delville Wood.

The Russians occupy Brody and repulse the Austro-Germans on the whole front north to the Kovel-Rojitche railway.

Capt. Charles Fryatt of the British steamship *Brussels* is executed by the Germans at Bruges after conviction by court-martial of attempting to ram a German submarine on March 28, 1915.

30.—The British and French advance on a six-mile front between Delville Wood and the Somme.

31.—A contingent of Russian troops joins the Allied forces at Saloniki.

The Turkish port of Yembo, on the Red Sea, is reported captured by Arab rebels.

AUGUST

1.—British naval forces occupy the port of Sadani, German East Africa.

2.—The Italian battleship *Leonardo da Vinci* is destroyed by an internal explosion in Taranto Harbor.

3.—The French at Verdun storm the village of Fleury and carry all the trenches on the Fleury-Thiaumont front.

4.—The French at Verdun twice storm the Thiaumont work and lose and recapture Fleury.

The Belgian War Office reports the capture of the railway terminus of Kigoma, German East Africa.

5.—The British carry the second line of German positions on a two-mile front west of Pozières.

The British rout a strong Turkish force at Romani, east of the Suez Canal, taking over 3,000 prisoners.

6.—The Italians storm a series of important positions east of Monfalcone.

7.—The Italians capture the bridgehead of Gorizia.

The Russians capture Tlumach, east of Stanislau.

8.—The British advance south of Guillemont; the French advance on a front of four miles north of the Somme.

The Russians south of the Dniester capture Nizniow and Sysmienitsa, east of Stanislau.

The Turks recapture from the Russians the Armenian towns of Biltis and Mush.

9.—The Italians occupy Gorizia, taking 10,000 prisoners.

The Russians capture Kryplin, south of Stanislau, and cut the Monasterzyska-Nizniow railroad.

German Zeppelins bombard towns on the east coast of England, killing six persons.

10.—The Russians occupy Stanislau and cross the Bystritza; north of the Dniester they cross the Zlota Lipa, capture Monasterzyska, and repulse the Austrians at Gliadka and Voroblevsk, on the Sereth.

The Italians capture Boschini, Rubbia and San Martino del Carso and occupy the whole of the Doberdo Plateau.

The Allies' Balkan force captures Doiran station, in Serbian territory.

12.—The French carry German third-line positions on a front of over four miles between Hardecourt and Buscourt.

The Russians capture Kosloff, west of Tarnopol, and the whole line of the Stripa; they occupy Nadworna, south of Stanislau, and cross the Bystritza.

The Italians capture Oppacchiasella.

13.—The Russians capture Maryampol, southeast of Halicz.

14.—The Russians cross the Zlota Lipa at several points and capture Tustobasy, northwest of the Dniester.

15.—British naval forces capture Bagamojo, German East Africa.

16.—The French advance on a three-mile front north and south of the Somme, around Maurepas and below Belloy-en-Santerre.

17.—The Russians occupy Lysiets, southwest of Stanislau.

The Bulgarians capture Florina, Greece, from Serbian forces.

18.—The British and French attack on the whole front from Pozières to the Somme and gain towards Guichy and Guillemont and in and about Maurepas.

The French before Verdun drive the Germans out of Fleury.

The Russians penetrate the Austro-German lines on the Stokhod west of Lake Nobel and capture Tobol.

The Bulgarians occupy Demir-Hissar, Macedonia, and advance on the port of Kavala against the resistance of Greek garrisons.

19.—The British attack on the whole 11-mile front south and east of Thiepval and advance at Thiepval, High Wood and north of Pozières, and penetrate Guillemont.

The Bulgarians occupy the Greek forts of Lise and Starcista, west of the Struma.

The British cruisers *Nottingham* and *Falmouth* are sunk by German submarines in the North Sea; a German submarine is sunk in the engagement and the German battleship *Westfalen* is torpedoed and damaged by a British submarine.

20.—The French capture a fortified wood between Guillemont and Maurepas.

The Russians occupy Pereskul and Jablonitza, on the Cheremosh south of Kuty.

The Allied forces at Saloniki assume the offensive on the entire front; the Anglo-French forces cross the Struma northwest of Seres; the Serbians occupy the forts of Kal-mak-Celar but lose Banica to the Bulgarians.

A contingent of Italian troops joins the Allied forces at Saloniki.

22.—British forces occupy Kilossa, German East Africa.

23.—The Bulgarians occupy Kostour and Kastoria, south of Florina; the British cross and destroy three bridges over the Angista.

24.—The French complete the capture of Maurepas and advance eastward on a mile front.

The Russians recapture Mush, Armenia.

German airships make two raids on the east and southeast coasts of England; one reaches the outskirts of London and kills eight civilians.

25.—The Bulgarians and Germans enter the Greek seaport town of Kavala and occupy all but one of the forts; British warships in the harbor bombard the Bulgarian positions; the Bulgarians invade Albania and occupy Malik.

26.—The German merchant submarine *Bremen* sails from Bremen and is not again heard from.

27.—Rumania declares war on Austria and strikes at the passes of the Transylvania Alps.

Italy declares war on Germany from Aug. 28.

28.—Germany declares war on Rumania.

29.—The Russians capture Panker Mountain, near the Hungarian Carpathian frontier, and occupy Rafalov, on the Bystritza-Nadworna.

The Bulgarians capture the Greek city of Drama, taking the garrison prisoner.

Rumania presents an ultimatum to Bulgaria demanding the evacuation of Serbian territory.

Field Marshal von Hindenburg is appointed Chief of the German General Staff, succeeding Gen. Erich von Falkenhayn.

30.—The Rumanians occupy Kronstadt and Hermannstadt, Transylvania.

31.—The Rumanians advancing in Transylvania occupy Petroseny.

Greek revolutionists seize the administration of a part of Greek Macedonia and capture the garrisons in Saloniki, Vodena and Fort Little Karaburun.

Bulgaria and Turkey declare war on Rumania.

SEPTEMBER

1.—The Rumanians capture Orsova.

2.—The Rumanians in Transylvania capture Borszek.

Bulgarian and German forces invade Rumania along the Dobrudja frontier.

Great Britain and France present a joint note to the Greek Government demanding control of the posts and telegraph, expulsion of enemy agents, and punishment of Greeks guilty of corruption and espionage on enemy behalf.

Thirteen German Zeppelins raid the eastern coast of England, killing two persons; one Zeppelin is brought down near London.

3.—The Allies advance on a seven-mile front between Ginchy and Cléry, the British capturing Guillemont and a part of Ginchy, and the French Forest and Cléry.

The Greek Government accepts in full the demands of the Allies.

4.—The French, attacking on a 12-mile front south of the Somme, capture Soyecourt and Chilly.

The Bulgarians capture Dobric, Rumania.

5.—The French capture Ommiecourt.

The Rumanians capture the Gyergyo-Ditro-Orsova Pass.

6.—The Bulgarians and Germans capture Turtukai, Rumania, taking 20,000 prisoners.

7.—The Rumanians and Russians recapture Dobric; the Rumanians in Transylvania occupy Olah Toplitza and five other towns.

8.—The Bulgarians recapture the fortress of Dobric and the ports of Baltjik, Kavarna and Kali Akra, Rumania.

9.—The British complete the occupation of Ginchy.

10.—The Bulgarians occupy Silistria, Rumania, and the Black Sea port of Mangalia.

11.—The French repulse the Bulgarians on a two-mile front north of Majadag; the British capture Nevolyen, east of the Struma.

Belgian forces capture Tabora, German East Africa.

12.—The French advance on a four-mile front between Combles and the Somme, capturing Hill 145 and Marrières Wood; later they capture Bouchavesnes.

The Bulgarians occupy the last of the forts of the Greek seaport of Kavala.

13.—The German War Office announces the deportation to Germany of the 6,400 Greek troops surrendered with the forts at Kavala.

14.—The French penetrate Rancourt, east of Combles.

The Italians penetrate the Austrian lines on the Carso and capture the height and village of San Grado.

The Rumanians in Transylvania cross the Aluta River and occupy Barsaolt, Bogata and Olterna.

The Serbians rout the Bulgarians east of the Cerna and pursue them nine miles, taking Gornizevo and the Malkanidze heights.

15.—The British capture Flers, Martinpuich, Courcelette, High Wood and most of Bouleaux Wood and take 2,300 prisoners; they use for the first time a new type of armored car.

The Rumanians in Transylvania occupy Fogaras, Homorov, Almas and Kohalam, and cross the Aluta near Fogaras.

16.—The British advance north of Courcelette and capture Moquet Farm and a strong position near Thiepval.

The Allies blockade the Greek coast from the mouth of the Struma River to the Greco-Bulgarian frontier.

17.—The French capture Vermandovillers and Berny, south of the Somme.

18.—The French capture Deniécourt.

The Austro-Germans storm the bridgehead near Zarecze on the Stokhod.

The French capture Florina, Macedonia; the Serbians capture Krushegrad and Neokazi, Serbia, and storm the summit of the Kaimakcalan Mountains.

19.—The Austrians recapture Petroseny from the Rumanians and repulse them through the Szurduk Pass, southeast of Hermannstadt.

20.—The Germans attack the French lines heavily on a three-mile front north of the Somme without success.

The Rumanians in Transylvania occupy Szekely Udvarhely; the Austrians recover the heights on both sides of the Vulcan Pass.

The Rumanians and Russians in Dobrudja repulse the Germans and Bulgarians after a five-day battle and resume the offensive.

22.—The French Chamber of Deputies votes unanimously a war credit of $1,767,600,000.

23.—The British in Macedonia cross the Struma at three points and occupy Jenmita.

German Zeppelins in large force raid the eastern counties of England, killing 38 persons in the London district and elsewhere; two Zeppelins are brought down in Essex and the crew of one captured.

25.—The British and French advance on a 12-mile front between Martinpuich and the Somme; the British capture Morval and Les Bœufs, north of Combles, and the French, Rancourt and Fregicourt.

German Zeppelins raid the east and northeast coasts of England, killing 36 persons.

The Turkish fortress of Taif, 65 miles southeast of Mecca, is reported captured by the Arab rebels.

26.—The British and French encircle and capture Combles, taking 3,000 prisoners and much war material; the British capture Thiepval and Gueudecourt.

The Austrian War Office announces the evacuation of the Vulcan and Szurduk passes before a Rumanian flanking movement; the Austrians occupy Red Tower Pass, in the rear of the Rumanians operating against Hermannstadt, Transylvania.

28.—David Lloyd George, in an interview with an American correspondent, warns neutral nations against initiating peace movements until Germany is thoroughly beaten.

29.—The Rumanian forces surrounded near Hermannstadt, Transylvania, regain the Red Tower Pass and retreat with heavy loss.

30.—The Russians renew the offensive in Galicia and gain along the Brody-Krasne railroad and south of Brzezany.

OCTOBER

1.—The British capture Eaucourt l'Abbaye.

The Rumanians cross the Danube in force between Rustchuk and Tutrakan.

The Serbians capture Kotchovie, northeast of Kaimakcalan.

German Zeppelins raid the east coast of England, killing one person; one Zeppelin is brought down on the outskirts of London.

2.—The Serbians in Macedonia capture Hovio; the French, Petorak and Verbeni; and the British, Janikov.

The French cruiser *Rigel* is sunk by a German submarine in the Mediterranean.

3.—The Rumanian force which crossed the Danube near Rjabovo retreats across the river before an encircling attack.

General von Bissing, military Governor of Belgium, issues a decree subjecting to forced labor all able-bodied Belgians who are receiving public support because of unemployment or otherwise.

4.—The French transport *Gallia* is sunk by a submarine in the Mediterranean, with a loss of 700 lives; the British transport *Franconia* also is sunk in the Mediterranean.

6.—The Russians in Dobrudja capture Kara Baka and Besaul.

7.—The British and French attack on a 10-mile front between the Albert-Bapaume road and Bouchavesnes; the British advance between Gueudecourt and Les Bœufs and capture Le Sars.

The Austro-Germans occupy Kronstadt and Szekelyudvarhely, Transylvania, evacuated by the Rumanians, who withdraw to the Carpathian frontier.

The French in Macedonia capture Kisovo and the Baba Mountains; the Serbians capture the Dobropolye heights.

8.—The Austro-Germans recapture Toerzvar, Transylvania.

The British in Macedonia capture three villages east of the Struma; the Serbians capture Skochivir.

The German submarine *U-53* sinks off Nantucket the British steamers *Strathdene, West Point, Stephano,* and *Kingston,* the Dutch steamer *Bloomersdijk,* and the Norwegian steamer *Christian Knudsen.*

9.—The British in Macedonia occupy Kalendra and Homodos; the Italians in Albania capture Klisura.

10.—The French advance on a three-mile front between Berny-en-Santerre and Chaulnes, capturing Bovent and most of Chaulnes Wood and penetrating Ablaincourt.

The Italians advance south of Rovereto, between Tobar and Vertoiba, and on the Carso, capturing Novavilla and taking over 6,400 prisoners.

The British in Macedonia capture Papalova and Prosenik and cut the railroad south of Demir-Hissar.

11.—The commander of the Anglo-French Mediterranean fleet presents an ultimatum to the Greek Government, demanding the surrender of the entire Greek fleet except three vessels, the disarmament of the latter, the dismantling of the coast forts and the control of the Piraeus-Larissa railroad; the Greek Government complies under protest.

The British transport *Crosshill* is sunk by a German submarine in the Mediterranean.

12.—The Greek Government accepts a demand of the commander of the Anglo-French fleet for the control of the Greek police.

13.—The Norwegian Government issues a decree, effective Oct. 20, forbidding belligerent submarines to traverse Norwegian waters except in cases of emergency, and then only on the surface and flying their national colors.

14.—The French advance on a mile front east of Belloy-en-Santerre and capture Genermont and a strongly fortified position northeast of Ablaincourt.

15.—The French north of the Somme penetrate Sailly-Saillisel.

16.—Royalist demonstrations against the Allies occur in Athens; a force of marines is landed from the Allied fleet to preserve order.

17.—The commander of the Allied fleet in Greek waters seizes the three remaining vessels of the Greek fleet.

18.—The French complete the capture of Sailly-Saillisel and carry the first German line on the whole front between Biaches and La Maisonnette.

19.—The Rumanians repulse the Austro-German invading force in the Oituz Valley to the frontier; in Dobrudja the Bulgarians and Germans renew the offensive on the whole front.

The Serbians cross the Cerna and capture Brod, Gardilovo and Velyeselo.

20.—The Germans in Dobrudja capture Tuzla, on the Black Sea.

The Russian battleship *Imperatritsa Maria* is destroyed by an internal explosion.

21.—The British advance on a three-mile front between Le Sars and Thiepval; the French capture a woods north of Chaulnes.

The Germans in Dobrudja repulse the Rumanians on the whole front and capture Teprai Sari and Cobadin.

22.—The French capture the whole of Ridge 128, west of Sailly-Saillisel.

The Germans capture the Rumanian Black Sea port of Constanza and cut the Constanza-Cernavoda railroad.

23.—The Germans in Dobrudja capture Medjidie and Rashova; south of Kronstadt the Austrians capture the Rumanian town of Predeal.

24.—The French attack on a four-mile front northeast of Verdun and pierce the German lines to a maximum depth of two miles, capturing the village and fort of Douaumont, La Caillette Wood, the Thiaumont Redoubt, and the Haudromont quarries, and taking 4,500 prisoners.

The Austro-Germans capture Vulcan Pass, in the Transylvania Alps.

The Italians in southern Albania form a junction with the Allied forces in Macedonia.

25.—The Germans in Dobrudja capture the bridgehead of Cernavoda; the Rumanians destroy the bridge and retreat across the Danube.

26.—A squadron of German destroyers, attacking the British transport service in the English Channel, is engaged by a British squadron; two British destroyers, an empty transport and six fishing vessels are sunk.

The Rumanians on the Transylvania front capture Balan, northwest of Okna.

27.—The French before Verdun capture a quarry northeast of Douaumont.

The Rumanians recapture Piscul.

28.—The French in Macedonia capture Gardilovo.

The German Reichstag approves a new war credit of $2,856,000,000.

29.—The Greek Government announces that King Constantine has approved the transfer of the Greek forces in Thessaly and Epirus to the Peloponnesus.

31.—The Austro-Germans in Rumania

capture Racovitza and Titeshti, in the Alt Valley.

The British in Macedonia capture Barakli-Azuma, Prosenik and Kumli, east of the Struma.

NOVEMBER

1.—The Italians advance on a wide front east of Gorizia, capturing Bossvica and taking 5,000 prisoners.

The Greek Venizelist forces occupy Katerina, southwest of Saloniki.

2.—The Germans east of Verdun evacuate Fort Vaux, which the French occupy without opposition.

4.—The French east of Verdun penetrate the village of Vaux.

5.—The French capture most of Saillisel.

The French east of Verdun capture Damloup and complete the capture of Vaux.

The Rumanians and Russians assume the offensive in Dobrudja and drive the Bulgarians and Germans out of the villages of Daeni, Gariot, Rosman and Gaidar, 40 miles north of the Cernavoda-Constanza railway.

The German Emperor and the Emperor of Austria-Hungary proclaim Russian Poland an independent state, with an hereditary monarchy and a constitutional government.

6.—The British P. & O. liner *Arabia* is sunk without warning by a submarine in the Mediterranean; the 437 passengers and most of the crew are saved.

7.—The French capture Ablaincourt and Pressoire.

8.—The Rumanians advancing in Dobrudja reoccupy Hirsova and Topal.

The Austro-Germans in western Rumania capture Surdoiu.

9.—The Russians in Rumania occupy Dunareav, in the Danube marshes, two miles west of Cernavoda.

10.—The Russians advancing in Dobrudja occupy Topal and Ghisdarechti.

Several German torpedo boats are sunk in an engagement with Russian warships in the Gulf of Finland.

11.—The Serbians capture Polog, north of the Cerna, and occupy Culse Hill.

12.—The French complete the capture of Saillisel.

The Austro-Germans capture Dicta and Arsuriler, in the Gyergyo Mountains, and Candesti, northwest of Campulung.

The Serbians capture Iven, five miles north of Polog.

13.—The British advance on a five-mile front north and south of the Ancre, to a maximum depth of over a mile, capturing Beaumont-Hamel and St. Pierre Divion and taking more than 3,500 prisoners.

The Austro-Germans in western Rumania capture Bumbeshti, south of Vulcan Pass.

14.—The British advancing along the Ancre capture Beaucourt.

The Rumanians in Dobrudja capture Boasic, on the Danube.

15.—The Germans attack heavily the French lines between Les Bœufs and Bouchavesnes and about Ablaincourt and make slight gains in St. Pierre Vaast Wood and in the village of Pressoire.

The Serbians and French in Macedonia capture Baldentsi, Negotin, and Yarashok Monastery, outflank the Bulgarians from the fortifications based on Kenali, occupy Kenali and other villages west of the Cerna, and repulse the Bulgarians to the Viro River.

16.—The French lose and recover a part of the village of Saillisel and drive the Germans out of Pressoire.

General von Beseler, German military Governor of Poland, issues a proclamation providing for the organization of the Jewish religious communities in the Government of Warsaw.

17.—Admiral Fournet, commander of the Anglo-French fleet in the Mediterranean, presents to the Greek Government a demand for the surrender to the Allies of all arms, artillery and munitions of the Greek Army excepting 50,000 rifles in actual use.

18.—The Austro-Germans in western Rumania penetrate the Wallachian plain and cross the Oesova-Craiova and Caliman-Suiol railways.

The Serbians capture Hill 1,378, east of Monastir.

19.—The French and Russians occupy Monastir, hastily evacuated by the Bulgarians and Germans, and continuing their advance, capture Hill 821 and the village of Kirklina.

Portuguese forces occupy the ports of Linda and Moama, German East Africa.

Admiral Fournet, commander of the Anglo-French fleet in the Mediterranean, notifies the German, Austrian, Bulgarian and Turkish diplomatic corps at Athens to prepare for deportation within 48 hours.

20.—The Serbians advancing north of Monastir capture Rapesh; the French capture Krani, on Lake Presba.

21.—The Austro-Germans in western Rumania capture Craiova.

The Bulgarians and Germans retreating north of Monastir stand on the Snegovo-Makovo line of heights; the French capture Leskovets, on Lake Presba, and the Serbians Budimirtsa.

The British hospital ship *Britannic*, the newest and largest of the White Star liners, is sunk by a mine off the island of Kea, in the Ægean, with a loss of 24 lives.

22.—The Rumanians destroy the Danube bridge at Corabia, 50 miles southeast of Craiova.

23.—The Austro-Germans capture Orsova, Hungary, and Turnu Severin, across the Danube in Rumania.

The Rumanians and Russians in Dobrudja advance on the whole front, cross the Kartal River and capture five villages 15 miles north of the Cernavoda-Constanza railroad.

A German destroyer squadron bombards the English coast ineffectively in the vicinity of Ramsgate.

The Greek Government refuses the demand of the Allies for the surrender of the arms and munitions of the Greek Army.

The British Government issues a proclamation declaring money, negotiable in-

struments and securities absolute contraband.

24.—The British hospital ship *Braemar Castle* is reported sunk by a mine or torpedo in the Ægean Sea.

Admiral Fournet delivers an ultimatum to the Greek Government requiring delivery of the arms and munitions of the Greek Army before Dec. 1.

25.—The Austro-German forces invading Rumania from the north and west establish contact with the force which crossed the Danube; in the Alt Valley they capture Ramnitzu and Valcea.

The Greek Provisional Government, headed by M. Venizelos at Saloniki, declares war on Germany and Bulgaria.

26.—The Austro-Germans capture Alexandria and flank the Rumanians from the line of the Alt.

The French battleship *Suffren* is sunk by a German submarine off the Portuguese coast.

27.—German Zeppelins raid the northeast coast of England; two are brought down in the North Sea.

The French transport *Karnak*, with troops for Saloniki, is sunk by a German submarine near Malta.

28.—The Austro-Germans in Rumania capture Pitechti, Curtea de Arges, and Giurgiu; Bulgarian forces cross the Danube at Rahovo, Lom-Palanka and Vidin, capturing Beshet and Kalafatu.

The Rumanian Government is removed from Bucharest to Jassy.

29.—The Austro-Germans capture Campulung, Rumania, opening the Torzburg Pass, and Tzomana, 16 miles south of Bucharest.

The Greek Government rejects the Allies' ultimatum demanding the surrender of the arms and munitions of the Greek Army; General Dracos, Minister of War, resigns and General Hazzopoulos is appointed in his place.

Adm. Sir John Jellicoe is appointed First Sea Lord of the British Admiralty, succeeding Adm. Sir Henry B. Jackson; he is succeeded in command of the Grand Fleet by Adm. Sir David Beatty.

30.—The Russians and Roumanians assume the offensive in Dobrudja and on the Rumanian frontier.

DECEMBER

1.—The Austro-Germans break the Rumanian front southwest of Pitechti, on the Argechu; the Russians penetrate Kirlibaba; the Rumanians recapture the western end of the Cernavoda bridge, and, taking the offensive south of Bucharest, recapture the villages of Tzomana and Gostinari.

The Allies' ultimatum to the Greek Government expires; French, British and Italian marines are landed at Piraeus and enter Athens; they are under desultory attack by Greek soldiers throughout the day, losing over 50 killed; late at night King Constantine agrees to deliver six of the 10 mountain batteries demanded and an agreement is reached for a three days' armistice and the withdrawal of the Allied force.

2.—The Russians on the Transylvanian frontier capture Asaul and Sulty; the Austro-Germans cross the Argechu below Gaechti.

The Allied troops are withdrawn from Athens; an embargo is placed on all Greek shipping in ports of the Allies in consequence of the attacks of Greek forces.

3.—The Austro-Germans defeat the Rumanians on the Argechu and capture Tergovistea, north, and Gradichtea, south, of Bucharest, and begin bombardment of the capital.

Premier Trepoff of Russia announces in the Duma that an agreement concluded among the Allies in 1915 definitely established Russia's right to Constantinople and the Dardanelles.

4.—The Austro-Germans cross the Bucharest-Tergovistea railroad.

The Italian steamer *Palermo*, with 25 Americans aboard, is sunk by a submarine off the Spanish coast.

5.—The Austro-Germans capture Sinaia and repulse the Rumanians from their remaining positions on the Argechu.

6.—The Austro-Germans capture Bucharest, Ploechti and Campino, Rumania.

The Rumanian forces of 8,000 men cut off in western Rumania surrender to the Austro-Germans.

The representatives of the Allies in Athens demand of the Greek Government an explanation of Greek military activity.

7.—The Austro-Germans cut off the Rumanians retreating from the Predeal and Altschanz passes and take 10,000 prisoners on the Rumanian front.

8.—The Anglo-French naval forces begin a blockade of the coasts of Greece.

9.—The Rumanians assume the offensive on the Buzeu-Ploechti road and repulse the Austro-Germans across the Grikovul River; Bulgarian forces cross the Danube between Silistria and Cernavoda.

10.—The Bulgarians capture the western bridgehead of the Cernavoda bridge.

11.—The Austro-Germans in Rumania capture Urziceni and Mizil, between Ploechti and Buzeu.

12.—The German Government and the Governments of Austria-Hungary, Bulgaria and Turkey hand to the diplomatic representatives of the United States, Spain and Switzerland an identic note for transmission to the Entente powers proposing negotiations for peace.

The French Government announces the appointment of Gen. Robert Georges Nivelle as commander-in-chief of the French armies.

14.—The Austro-Germans in Rumania occupy Buzeu.

The British horse transport *Russian*, westbound and empty, is sunk by a submarine in the Mediterranean with a loss of 28 lives, including 17 American muleteers.

Andrew Bonar Law, speaking in the British House of Commons, declares that peace terms must provide reparation for the past and security for the future; the House of Commons adopts unanimously a vote of credit of $2,000,000,000.

The representatives of the Allies in Athens present an ultimatum to the Greek Government, expiring in 24 hours, requiring the removal of certain troops

and war material and the stoppage of all movement of troops and war material toward the north, and declaring that non-compliance within 24 hours will be regarded as hostile act.

15.—The French advance on a 6¼-mile front northeast of Verdun, penetrating the German lines to a depth of two miles, capturing the villages of Vacherauville and Louvemont and the fortified works of Hardaumont and Besonvaux, and taking over 11,000 prisoners and 115 cannon.

The Greek Government accepts unreservedly the ultimatum of the Entente Allies.

16.—The French northeast of Verdun capture the village of Bezonvaux and advance in the Caurières Wood.

17.—The Germans northeast of Verdun recapture the Chambrettes farm.

18.—The French northeast of Verdun recover the Chambrettes farm.

President Wilson addresses a note to the belligerent nations suggesting an immediate and definite declaration of their respective views as to the terms on which the war might be concluded and a durable peace established.

19.—Premier Lloyd George, speaking in the British House of Commons, outlines the policy of his Government and defines the terms on which the Allies will negotiate peace with Germany as "complete restitution, full reparation, and effectual guarantees" for the future.

20.—The British House of Commons adopts a resolution for the addition of 1,000,000 men to the land forces.

21.—The Austro-Germans attack and repulse the Russians along the whole front in Dobrudja.

British forces reoccupy El Arish, Egypt, held by the Turks for two years.

Two British destroyers are sunk in collision in the North Sea.

The Entente Allies present to the Greek Government a note demanding control of the telegraphs, posts and railways, release of Venizelist prisoners, prohibition of meetings of reservists, and an inquiry by a mixed commission of the disturbances of Dec. 1 and 2.

22.—The Austro-Germans in Dobrudja occupy Tulcea, on the lower Danube.

A British force captures a strong Turkish position at Maghdadah, southeast of El Arish, taking over 1,130 prisoners and much war material.

23.—The Austro-Germans in Dobrudja capture Isakcha, on the Danube.

24.—The Austro-Germans in Dobrudja capture Tultcha.

25.—The Austro-Germans in Rumania capture Filipechti, between Buzeu and Braila.

26.—The Austro-Germans in Wallachia capture Rimnik-Sarat.

The German Government replies to President Wilson's note, ignoring his suggestion of a definite statement of peace terms and proposing a conference of belligerents.

27.—British aeroplanes destroy the Chicaldar railroad bridge, 18 miles east of Adana.

The French cruiser *Gaulois* is sunk by a submarine in the Mediterranean.

28.—The Austro-Germans in Dobrudja capture Ratchelu.

29.—The Austro-Germans in Rumania capture Bordestchi, on the Rimnik.

30.—The French Government, on behalf of the Entente Allies, replies to the note of the Central Powers proposing a peace conference, reviewing the causes and course of the war and refusing to consider peace until Germany and her allies are prepared to accept terms providing reparation for the past and guarantees for the future.

31.—The Austro-Germans on the Moldavian frontier capture Herestrau and Ungereni, in the Zabella Valley; in Dobrudja they capture a bridgehead position east of Matchin.

The Allies present a note to the Greek Government demanding further reduction of the Greek forces, release of Venizelists, reparation for attacks, and prohibition of meetings of reservists.

The British steamer *Yarrowdale*, captured by a German raider in the South Atlantic, with several hundred persons taken from captured vessels, is brought into Swinemünde by a prize crew.

AMERICAN NECROLOGY

ABBE, Cleveland, Chevy Chase, Md., Oct. 28, aged 77; meteorologist.

ADAMS, Elmer Bragg, St. Louis, Oct. 24, aged 74; U. S. circuit judge, Eighth Circuit, since 1905.

ANDERSON, Thomas Henry, Denver, Oct. 1, aged 68; justice of the Supreme Court of the District of Columbia.

ANGELL, James Burrill, Ann Arbor, Mich., April 1, aged 87; president emeritus of the University of Michigan.

ARCHBOLD, John Dustin, Tarrytown, N. Y., Dec. 5, aged 68; president of the Standard Oil Co. of New Jersey.

ARNOLD, Olney, Lisbon, Portugal, March 5, aged 54; American diplomatic agent to Egypt since 1913.

ASHLEY, Clarence Degrand, New York, Jan. 26, aged 64; dean of the New York University Law School.

BABCOCK, Charles Henry, New York, Jan. 6, aged 71; Protestant Episcopal clergyman.

BABCOCK, Stephen, Yonkers, N. Y., May 19, aged 83; teacher of the blind.

BARKER, Albert Smith, Washington, Jan. 30, aged 72; rear-admiral, U. S. N., retired.

BARROWS, Charles Clifford, New York, Jan. 2, aged 58; surgeon.

BASSETT, Austin Bradley, Hartford, Conn., Oct. 5, aged 57; secretary of Hartford Theological Seminary.

BEAN, Tarleton Hoffman, Albany, Dec. 28, aged 70; ichthyologist.

BIRDSALL, Benjamin P., Clarion, Iowa, May 16, aged 57; Representative from Iowa, 1903-9.

BLAKE, Lucien Ira, Boston, May 4, aged 61; electrical engineer and inventor.

BLANCHARD, James Armstrong, New

York, July 9, aged 70; justice of the Supreme Court of New York, 1900-15.

BLOW, Susan Elizabeth, New York, March 26, aged 73; kindergartner.

BOARMAN, Aleck, Loon Lake, N. Y., Aug. 31, aged 76; U. S. district judge for the Western District of Louisiana.

BOGUE, Virgil Gay, at sea, Oct. 14, aged 70; civil engineer.

BOLDT, George C., New York, Dec. 5, aged 65; proprietor of the Waldorf-Astoria Hotel, New York, and Bellevue-Stratford Hotel, Philadelphia.

BOLTON, Sarah Knowles, Cleveland, Feb. 21, aged 74; author.

BRADLEY, George Beckwith, Corning, N. Y., Jan. 9, aged 90; former judge of the New York Court of Appeals.

BREWER, Leigh Richmond, Helena, Mont., Aug. 28, aged 77; Protestant Episcopal Bishop of Montana.

BROOKS, Franklin Eli, St. Augustine, Fla., Feb. 7, aged 55; Representative from Colorado, 1903-7.

BROWN, Francis, New York, Oct. 15, aged 66; president of Union Theological Seminary.

BROWN, Thomas Wistar, Villanova, Pa., April 16, aged 90; president of Haverford College.

BROWN, William G., Washington, March 9, aged 59; Representative from West Virginia since 1911.

BUNCE, William Gedney, Hartford, Conn., Nov. 5, aged 76; painter.

BURLEIGH, Edwin Chick, Augusta, Me., June 16, aged 72; Senator from Maine since 1913.

BURRILL, Thomas Jonathan, Urbana, Ill., April 14, aged 76; professor emeritus of botany in the University of Illinois.

BURROUGHS, Edith Woodman (Mrs. Bryson), Flushing, N. Y., Jan. 6, aged 44; sculptor.

CALHOUN, William James, Chicago, Sept. 19, aged 67; U. S. Minister to China, 1909-13.

CANNON, James Graham, Golden's Bridge, N. Y., July 5, aged 58; banker.

CARPENTER, Louis Henry, Philadelphia, Jan. 21, aged 76; brigadier-general, U. S. A., retired.

CARROLL, Howard, New York, Dec. 30, aged 62; journalist and author.

CARTER, Thomas Coke, Cincinnati, Feb. 27, aged 65; bishop of the United Brethren Church.

CATLIN, Charles Albert, Providence, April 12, aged 66; chemist.

CATLIN, Isaac Swartwood, New York, Jan. 19, aged 80; brigadier-general, U. S. A., retired.

CHASE, William Merritt, New York, Oct. 25, aged 66; portrait painter.

CHENEY, Charles Edward, Chicago, Nov. 15, aged 80; Reformed Episcopal Bishop of Chicago.

CLARKE, James P., Little Rock, Ark., Oct. 1, aged 62; Senator from Arkansas since 1903.

COLTON, George Radcliffe, Washington, April 7, aged 50; Governor of Porto Rico, 1909-13.

CONN, Granville Priest, Wayne, Pa., March 24, aged 84; surgeon.

COOK, Albert John, Owosso, Mich., Sept. 29, aged 74; state commissioner of horticulture of California.

COOK, Francis Augustus, Northampton, Mass., Oct. 8, aged 73; rear-admiral, U. S. N., retired.

COOK, George Washington, Pueblo, Col., Dec. 17, aged 65; Representative from Colorado, 1907-9.

COOK, Henry Clay, Fall River, Mass., Feb. 22, aged 78; brigadier-general, U. S. A., retired.

COOK, Walter, New York, March 25, aged 69; architect.

COOLEY, LeRoy Clark, New York, Sept. 20, aged 82; professor emeritus of physics in Vassar College.

CORTHELL, Elmer Lawrence, Albany, N. Y., May 16, aged 55; civil engineer.

COUES, Samuel Franklin, Cambridge, Mass., May 1, aged 90; rear-admiral, U. S. N., retired.

COX, George B., Cincinnati, May 20, aged 63; politician.

CUNEO, Cyrus Cincinatto, London, July 23; artist and illustrator.

CUSHING, Ernest Watson, Boston, Aug. 27, aged 69; surgeon.

CUSHING, Howard Gardiner, New York, April 26, aged 47; portrait painter.

DALY, Joseph Francis, Yonkers, N. Y., Aug. 6, aged 75; lawyer.

DANA, William Henry, Warren, O., Feb. 18, aged 69; musician.

DAVIES, Acton, Chicago, June 12, aged 46; dramatic critic.

DAVIS, Charles Albert, Washington, April 9, aged 54; geologist.

DAVIS, Henry Gassaway, Washington, March 11, aged 92; Senator from West Virginia, 1871-83; Democratic candidate for Vice-President, 1904.

DAVIS, Horace, San Francisco, July 13, aged 85; president of the University of California, 1887-90; Representative from California, 1877-81.

DAVIS, Richard Harding, Mount Kisco, April 11, aged 52; war correspondent and author.

DAWSON, Jackson Thornton, Boston, Aug. 3, aged 75; horticulturist.

DAWSON, William Mercer Owens, Charleston, W. Va., March 12, aged 62; Governor of West Virginia, 1905-9.

DODD, Frank Howard, New York, Jan. 10, aged 71; publisher.

DODGE, Grenville Mellen, Council Bluffs, Iowa, Jan. 3, aged 84; civil engineer, Civil War general.

DONOHO, Ruger, New York, Jan. 28, aged 58; painter.

DORSEY, Stephen W., Los Angeles, March 20, aged 74; Senator from Arkansas, 1873-9.

DOUGLAS, Amanda Minnie, Newark, N. J., July 18, aged 79; author.

DRAKE, Alexander Wilson, New York, Feb. 4, aged 73; late art director of the *Century Magazine*.

DUKE, Basil Wilson, New York, Sept. 16, aged 78; lawyer, Confederate general.

DUNCAN, Louis, Pelham Manor, N. Y., Feb. 13, aged 53; electrical engineer.

DUNCAN, Norman, Willoughby, O., Oct. 18, aged 45; author.

DWIGHT, Timothy, New Haven, Conn., May 26, aged 87; president of Yale University, 1886-99.

EATON, Seymour, Lansdowne, Pa., March 13, aged 57; author.

ELDRIDGE, Charles Henry, Norfolk, Va., July 16, aged 75; rear-admiral, U. S. N., retired.

ELKELL, Levi Henry, Amherst, Mass., Dec. 27, aged 62; professor of Greek in Amherst College.

ELLIS, Edward Sylvester, Cliff Island, Me., June 20, aged 76; author.

ELSNER, Henry Leopold, Washington, Feb. 17, aged 61; professor of medicine in Syracuse University.

EMERY, John Runkle, Morristown, Jan. 30, aged 73; vice-chancellor of New Jersey.

ENNEKING, John Joseph, Boston, Nov. 17, aged 76; painter.

ESHLEMAN, John Morton, Indio, Cal., Feb. 28, aged 39; lieutenant-governor of California.

EVELAND, William Perry, Mount Holly Springs, Pa., July 24, aged 52; Methodist Episcopal missionary bishop.

FERGUSON, Samuel David, Monrovia, Liberia, Aug. 2, aged 74; Protestant Episcopal Bishop of Liberia.

FERNALD, Merritt Caldwell, Oeono, Me., Jan. 8, aged 77; president of the University of Maine, 1879-93.

FISKE, Stephen, New York, April 27, aged 75; dramatic critic and author.

FLAGG, Charles Noel, Hartford, Nov. 10, aged 67; painter.

FLOY, Henry, New York, May 5, aged 49; electrical engineer.

FOX, Charles Eben, Washington, Feb. 13, aged 64; rear-admiral, U. S. N., retired.

FULLER, Anna, Boston, July 18, aged 62; author.

GALLAGHER, Charles Wesley, Baltimore, Dec. 15, aged 70; president of the Maryland College for Women.

GARDNER, William A., Wianno, Mass., May 11, aged 57; president of the Chicago & Northwestern Railway.

GARNETT, James Mercer, Baltimore, Feb. 18, aged 75; educator.

GARRISON, Francis Jackson, Newtonville, Mass., Dec. 11, aged 68; author.

GEORGE, Henry, Washington, Nov. 14, aged 54; journalist, Representative from New York, 1911-15.

GILCHRIST, William Wallace, Easton, Pa., Dec. 20, aged 70; organist and composer.

GILDER, Jeannette Leonard, New York, Jan. 17, aged 66; journalist and literary critic.

GOODING, William Lambert, Carlisle, Pa., Sept. 4, aged 65; professor of philosophy in Dickinson College.

GORTON, David Allyn, New York, Feb. 22, aged 83; physician and author.

GRAHAM, William Montrose, Waldour, Md., Jan. 17, aged 81; brigadier-general, U. S. A., retired.

GREEN, Hetty Howland Robinson (Mrs. Edward H.), New York, July 3, aged 80; capitalist.

GREGG, David McMurtrie, Reading, Pa., aged 83; Civil War general.

GROSVENOR, William Mercer, New York, Dec. 9, aged 53; Protestant Episcopal clergyman.

HARKNESS, Charles William, New York, May 1, aged 55; lawyer.

HARRIS, Addison C., Indianapolis, Sept. 2, aged 75; U. S. Minister to Austria-Hungary, 1899-1901.

HARRIS, Norman Wait, Lake Geneva, Wis., July 15, aged 69; banker and philanthropist.

HARRIS, William, Bayside, N. Y., Nov. 25, aged 70; theatrical manager.

HART, Charles Edward, New Brunswick, N. J., Dec. 16, aged 78; Presbyterian clergyman.

HART, James Morgan, Washington, April 18, aged 76; professor emeritus of English in Cornell University.

HASKINS, Kittredge, Brattleboro, Vt., Aug. 7, aged 80; Representative from Vermont, 1901-9.

HAYES, Charles Willard, Washington, Feb. 8, aged 56; geologist.

HENDEE, George Ellsworth, Brookline, Mass., Sept. 10, aged 75; rear-admiral, U. S. A., retired.

HEPBURN, William Peters, Clarinda, Iowa, Feb. 7, aged 82; Representative from Iowa, 1881-7, 1893-1909.

HERBERMANN, Charles George, New York, Aug. 24, aged 75; editor of the *Catholic Encyclopædia*.

HILGARD, Eugene Woldemar, Berkeley, Cal., Jan. 8, aged 83; professor emeritus of agriculture in the University of California.

HILL, James Jerome, St. Paul, May 29, aged 77; financier.

HILL, John Alexander, East Orange, N. J., Jan. 24, aged 57; publisher.

HOPSON, George Bailey, Annandale, N. Y., Aug. 30, aged 78; professor emeritus of Latin in St. Stephen's College.

HOWELL, James Edward, Newark, N. J., Sept. 26, aged 68; vice-chancellor of New Jersey.

HOXIE, Robert Franklin, Chicago, June 22, aged 47; professor of economics in the University of Chicago.

HUNKER, John Jacob, Asheville, N. C., Dec. 16, aged 72; rear-admiral, U. S. N., retired.

HYDE, John McEwen, Brookline, Mass., Oct. 25, aged 75; brigadier-general, U. S. A., retired.

IRWIN, Harvey S., Vienna, Va., Sept. 3, aged 71; Representative from Kentucky, 1901-3.

IVES, William, Buffalo, Aug. 21, aged 99; librarian.

JACOBS, Joseph, Yonkers, N. Y., Jan. 30, aged 61; Jewish scholar, editor of the *American Hebrew*.

JAMES, Thomas Lemuel, New York, Sept. 11, aged 85; Postmaster-General, 1881-2, banker.

JOHN, John Price Durbin, Greencastle, Ind., Aug. 7, aged 72; Methodist clergyman, educator and lecturer.

JOHNSON, Franklin, Brookline, Mass., Oct. 9, aged 79; professor emeritus of church history in the University of Chicago.

JOHNSTON, George Ben, Richmond, Va., Dec. 20, aged 63; surgeon.

JONES, Harry Clary, Baltimore, April 9, aged 50; professor of physical chemistry in Johns Hopkins University.

JUDSON, Adoniram Brown, New York, Sept. 20, aged 79; surgeon.

KAHN, David, Paris, Aug. 11, aged 70; banker.

KASTLE, Joseph Hoeing, Lexington, Ky., Sept. 24, aged 52; chemist, director of the Kentucky Agricultural Experiment Station.

KELLOGG, Clara Louise (Mrs. Carl Strakosch), New Hartford, Conn., May 13, aged 73; singer.

KERENS, Richard C., Merion, Pa., Sept. 4, aged 73; U. S. Ambassador to Austria-Hungary, 1909-13.

KINGMAN, Daniel C., Atlantic City, N. J., Nov. 14, aged 64; brigadier-general, U. S. A., retired.

KIRCHHOFF, Charles William Henry, Asbury Park, N. J., July 23, aged 63; late editor of the *Iron Age*.

LACEY, Edward Samuel, Evanston, Ill., Oct. 3, aged 80; banker, Representative from Michigan, 1881-5, Comptroller of the Currency, 1889-92.

LACY, Ernest, Philadelphia, June 17, aged 52; educator and playwright.

LAMAR, Joseph Rucker, Washington, Jan. 2, aged 58; justice of the U. S. Supreme Court since 1910.

LAZENBY, William Rane, Columbus, Ohio, Sept. 15, aged 65; professor of forestry in Ohio State University.

LEA, Preston, Wilmington, Del., Dec. 4, aged 75; Governor of Delaware, 1905-9.

LEE, James Grafton Carleton, Lake George, N. Y., July 26, aged 79; brigadier-general, U. S. A., retired.

LEE, Robert E., Pottsville, Pa., Nov. 20, aged 45; Representative from Pennsylvania, 1911-15.

LEONARD, Adna Bradway, Brooklyn, April 21, aged 78; Methodist Episcopal clergyman.

LINCOLN, David Francis, Boston, Oct. 17, aged 75; hygienist, author.

LINDSAY, George Henry, New York, May 25, aged 79; Representative from New York, 1901-13.

LITTLE, John Sebastian, Little Rock, Ark., Oct. 29, aged 63; Representative from Arkansas, 1894-1907, Governor of Arkansas, 1907-9.

LONDON, Jack, Glen Ellen, Cal., Nov. 22, aged 40; novelist.

LOW, Seth, Bedford Hills, N. Y., Sept. 17, aged 66; publicist, former mayor of Brooklyn, mayor of New York, and president of Columbia University.

LOWELL, Percival, Flagstaff, Ariz., Nov. 12, aged 61; astronomer.

LUCCOCK, George Naphtali, La Crosse, Wis., April 1, aged 59; Methodist Episcopal Bishop of Montana.

LUTZ, Frank J., St. Louis, March 24, aged 60; surgeon.

MCCLINTOCK, Emory, Bay Head, N. J., July 10, aged 75; actuary.

MCCORMICK, Andrew Phelps, Waco, Tex., Nov. 2, aged 83; U. S. circuit judge.

MCCURDY, Richard Aldrich, Morristown, N. J., March 6, aged 81; late president of the Mutual Life.

MCLEAN, John Roll, Washington, June 9, aged 67; publisher of the *Cincinnati Enquirer* and *Washington Post*.

MABIE, Hamilton Wright, Summit, N. J., Dec. 31, aged 70; author, associate editor of the *Outlook*.

MAHON, Thaddeus Maclay, Chambersburg, Pa., May 31, aged 76; Representative from Pennsylvania, 1893-1907.

MAPES, Charles Victor, New York, Jan. 23, aged 79; agricultural chemist.

MARTIN, William Alexander Parsons, Peking, Dec. 18, aged 89; Presbyterian missionary.

MARTINDALE, Thomas, near Skagway, Alaska, Sept. 13, aged 70; author.

MASON, Frank Holcomb, Paris, June 21, aged 76; U. S. consul-general at Paris, 1905-13.

MEARNS, Edgar Alexander, Washington, Nov. 1, aged 60; colonel, U. S. Army Medical Corps, retired, naturalist.

MEARS, Helen Farnsworth, New York, Feb. 17, aged 37; sculptor.

MERRELL, John Porter, New London, Conn., Dec. 8, aged 70; rear-admiral, U. S. N., retired.

MERRIFIELD, Webster, Pasadena, Cal., Jan. 22, aged 63; president of the University of North Dakota, 1891-1909.

MERRILL, Frederick James Hamilton, Los Angeles, Nov. 29, aged 55; geologist.

MERRITT, Edwin Atkins, Potsdam, N. Y., Dec. 26, aged 88; U. S. consul-general at London, 1881-5.

MERRY, John Fairfield, Washington, May 30, aged 76; rear-admiral, U. S. N., retired.

MESSITER, Arthur Henry, New York, July 2, aged 82; organist.

MICHAEL, William Henry, Washington, May 17, aged 70; U. S. consul-general at Calcutta, 1905-12.

MILLER, James, Temple, N. H., Dec. 11, aged 72; brigadier-general, U. S. A., retired.

MILLS, Albert Leopold, Washington, Sept. 18, aged 62; major-general, U. S. A., chief of the Division of Militia Affairs in the War Department.

MILLS, Benjamin Fay, Grand Rapids, Mich., May 1, aged 58; evangelist and lecturer.

MILLSPAUGH, Frank Rosebrook, Topeka, Kan., Nov. 22, aged 68; Protestant Episcopal Bishop of Kansas.

MOFFAT, James David, Washington, Nov. 4, aged 70; president emeritus of Washington and Jefferson College.

MOORE, James Hobart, Lake Geneva, Wis., July 17, aged 64; capitalist.

MORRIS, Edgar Coit, Syracuse, Dec. 25, aged 52; professor of English literature in Syracuse University.

MORSE, Anson Daniel, Springfield, Mass., March 13, aged 69; professor emeritus of history in Amherst College.

MOSBY, John Singleton, Washington, May 30, aged 82; Confederate soldier.

MOSS, Hunter Holmes, Atlantic City, July 15, aged 42; Representative from West Virginia since 1913.

MUHLENBERG, John Cameron, Washington, March 14, aged 67; brigadier-general, U. S. A., retired.

MÜNSTERBERG, Hugo, Cambridge, Mass., Dec. 16, aged 53; professor of psychology in Harvard University.

MURPHY, John Benjamin, Mackinac Island, Mich., Aug. 11, aged 58; surgeon.

NELSON, Julius, New Brunswick, N. J., Feb. 15, aged 57; professor of biology in Rutgers College.

NIXON, William C., St. Louis, Dec. 15, aged 58; president of the St. Louis & San Francisco Railroad.

NOBLE, Charles Henry, Indianapolis, March 4, aged 72; brigadier-general, U. S. A., retired.

NORTON, William Edward, New York, Feb. 25, aged 72; painter.

NOTT, Charles Cooper, New York,

March 6, aged 88; chief justice of the Court of Claims, 1896-1905.

OPPENHEIM, Nathan, New York, April 5, aged 50; physician.

OTT, Isaac, Easton, Pa., Jan. 1, aged 68; neurologist.

OWEN, Stephen Walker, Hagerstown, Md., April 16, aged 78; Lutheran clergyman.

PAGE, John Henry, West Point, N. Y., Oct. 9, aged 74; brigadier-general, U. S. A., retired.

PAINE, Charles Jackson, Weston, Mass., Aug. 12, aged 82; Civil War general, yachtsman.

PARKER, Charles Pomeroy, Cambridge, Dec. 2, aged 64; professor of Greek and Latin in Harvard University.

PARKER, Cutler Dunn, Brookline, Mass., Nov. 27; organist and composer.

PARKHURST, Howard Elmore, Lavallette, N. J., Aug. 18, aged 67; organist and composer.

PATTERSON, Thomas Macdonald, Denver, July 23, aged 75; Senator from Colorado, 1901-7.

PECK, George Wilbur, Milwaukee, April 16, aged 75; Governor of Wisconsin, 1891-5; author.

PEIRCE, Herbert Henry Davis, Portland, Me., Dec. 5, aged 67; U. S. Minister to Norway, 1906-11.

PENNYPACKER, Galusha, Philadelphia, Oct. 1, aged 72; brigadier-general, U. S. A., retired.

PENNYPACKER, Samuel Whitaker, Schwencksville, Pa., Sept. 2, aged 73; Governor of Pennsylvania, 1903-7.

PETERKIN, George William, Parkersburg, W. Va., Sept. 22, aged 75; Protestant Episcopal Bishop of West Virginia.

PLUMMER, Mary Wright, Dixon, Ill., Sept. 21; librarian.

POPE, William Hayes, Atlanta, Sept. 13, aged 46; U. S. district judge, District of New Mexico.

PORTER, Linn Boyd ("Albert Ross"), Brookline, Mass., June 29, aged 64; novelist.

PRATT, Silas Gamaliel, Pittsburgh, Oct. 31, aged 70; composer.

PRINCE, John Tilden, West Newton, Mass., Aug. 5, aged 71; educator and author.

PRITCHARD, Arthur John, Baltimore, Sept. 5, aged 80; rear-admiral, U. S. N., retired.

PROSSER, Charles Smith, Columbus, O., found drowned Sept. 12, aged 56; professor of geology in the Ohio State University.

RABINOWITZ, Solomon ("Sholem Aleichem"), New York, May 13, aged 57; Yiddish author.

RANGER, Henry Ward, New York, Nov. 7, aged 58; painter.

RAYMOND, Bradford Paul, Middletown, Conn., Feb. 27, aged 69; president of Wesleyan University, 1889-1908.

REED, John Oren, Ann Arbor, Jan. 22, aged 59; physicist.

REHAN, Ada, New York, Jan. 8, aged 55; actress.

REXFORD, Eben Eugene, Green Bay, Wis., Oct. 18, aged 68; author.

RICHTER, Henry Joseph, Grand Rapids, Mich., Dec. 26, aged 78; Roman Catholic Bishop of Grand Rapids.

RIDDLE, Matthew Brown, Pittsburgh, Sept. 1, aged 79; Reformed Church clergyman, editor and author.

RILEY, James Whitcomb, Indianapolis, July 22, aged 63; poet.

RIVERA, Luis Muñoz, San Juan, Porto Rico, Nov. 15, aged 57; Porto Rican journalist and politician, resident commissioner in Washington since 1910.

RODMAN, William Louis, Philadelphia, March 8, aged 57; surgeon.

ROGERS, William Pennock, Washington, May 14, aged 73; brigadier-general, U. S. A., retired.

ROYCE, Josiah, Cambridge, Mass., Sept. 14, aged 60; professor of history of philosophy in Harvard University.

RUSSELL, Charles Taze ("Pastor Russell"), Pampa, Tex., Oct. 31, aged 64; independent clergyman.

RUSSELL, Thomas Hubbard, New Haven, Conn., Feb. 2, aged 65; professor of surgery in Yale Medical School.

ST. JOHN, John Pierce, Olathe, Kan., Aug. 31, aged 83; Governor of Kansas, 1879-83. Prohibition candidate for President, 1884.

SCANNELL, Richard, Omaha, Jan. 7, aged 70; Roman Catholic Bishop of Omaha.

SCHNEIDER, Charles Conrad, Philadelphia, Jan. 8, aged 72; civil engineer.

SCHWAB, John Christopher, New Haven, Conn., Jan. 12, aged 50; librarian of Yale University.

SEABURY, William Jones, East Hampton, N. Y., Aug. 30, aged 79; Protestant Episcopal clergyman, professor of ecclesiastical polity and law in the General Theological Seminary.

SEARS, Lorenzo, Providence, R. I., Feb. 29, aged 77; author, former professor of American literature in Brown University.

SEAWELL, Molly Elliot, Washington, Nov. 15, aged 56; novelist.

SELIGMAN, James, Long Branch, N. J., Aug. 20, aged 92; banker.

SEWARD, Samuel Swayze, Pittsfield, Mass., Feb. 21, aged 77; Swedenborgian clergyman.

SHANAHAN, John W., Lancaster, Pa., Feb. 19, aged 69; Roman Catholic Bishop of Harrisburg.

SHERMAN, Frank Dempster, New York, Sept. 19, aged 56; professor of graphics in Columbia University; poet.

SHIRAS, Oliver Perry, Sea Breeze, Fla., Jan. 7, aged 82; U. S. district judge, Northern Iowa, 1882-1903.

SHIVELY, Benjamin Franklin, Washington, March 14, aged 58; Senator from Indiana since 1909.

SILVER, John Archer, Geneva, N. Y., Feb. 5, aged 52; professor of history in Hobart College.

SKINNER, Hubert Marshall, Chicago, June 4, aged 61; educator.

SLICER, Thomas Roberts, New York, May 29, aged 69; Unitarian clergyman.

SMITH, Arthur George, Iowa City, Nov. 5, aged 47; professor of mathematics in the University of Iowa.

SMITH, Clinton De Witt, Buffalo, Aug. 4, aged 62; agriculturist.

SMITH, William Sooy, Medford, Ore., March 4, aged 85; civil engineer.

SNOW, Marshall Solomon, Taunton, Mass., May 28, aged 73; late dean of the College in Washington University.

SOOYSMITH, Charles, New York, June 1, aged 59; civil engineer.

SPRAGUE, Austin Velorous Milton, Front Royal, Va., Jan. 27, aged 75; inventor.

STANLEY, William, Great Barrington, Mass., May 14, aged 57; electrical engineer, inventor.

STRONG, Josiah, New York, April 28, aged 69; Congregationalist clergyman.

SULLIVAN, Thomas Russell, Boston, June 28, aged 66; author.

SWAN, Henry Harrison, Grosse Pointe, Mich., June 12, aged 75; U. S. district judge for Eastern Michigan since 1891.

SWEET, John Edson, Syracuse, N. Y., May 8, aged 83; mechanical engineer.

TAYLOR, James Monroe, New York, Dec. 19, aged 68; president emeritus of Vassar College.

TAYLOR, Samuel Mac, Birmingham, England, Dec. 7, aged 60; U. S. consul at Birmingham.

THAYER, John R., Worcester, Mass., Dec. 19, aged 71; Representative from Massachusetts, 1899-1905.

THOMAS, Charles Monroe, Philadelphia, Jan. 14, aged 66; ophthalmologist.

THOMSON, John, Philadelphia, Feb. 23, aged 80; librarian of the Philadelphia Free Library.

THURSTON, John Mellen, Omaha, Neb., Aug. 9, aged 68; Senator from Nebraska, 1895-1901.

TJADER, Richard, New York, Dec. 27, aged 47; explorer, author and lecturer.

TOWNE, Robert Safford, New York, Aug. 3, aged 57; mining engineer.

TOULMIN, Harry Theophilus, Toulminville, Ala., Nov. 12, aged 78; U. S. district judge for Southern Alabama.

TOWNSEND, Wisner Robinson, New York, March 12, aged 58; surgeon.

TRIBBLE, Samuel Joel, Washington, Dec. 8, aged 48; Representative from Georgia since 1911.

TROWBRIDGE, John Townsend, Arlington, Mass., Feb. 12, aged 88; author.

UPHAM, Grace Le Baron ("Grace Le Baron"), Boston, June 16, aged 71; author.

VALENTINE, Robert Grosvenor, New York, Nov. 14, aged 43; Commissioner of Indian Affairs, 1909-12.

VAN HORN, Robert Thompson, Kansas City, Mo., Jan. 3, aged 91; Representative from Missouri, 1865-71, 1895-7.

VILLE, Charles Delavan, Los Angeles, Oct. 6, aged 75; brigadier-general, U. S. A., retired.

VINCENT, Frank, Woodstock, N. Y., June 19, aged 68; explorer and author.

VOORHEES, Theodore, Elkins Park, Pa., March 12, aged 68; president of the Philadelphia & Reading Railroad.

VREELAND, Charles E., Atlantic City, N. J., Sept. 27, aged 64; rear-admiral, U. S. N., retired.

WAIT, William Bell, New York, Oct. 25, aged 77; teacher of the blind.

WALKER, Asa, Annapolis, Md., March 7, aged 70; rear-admiral, U. S. N., retired.

WALLACE, Henry, Des Moines, Iowa, Feb. 22, aged 79; editor and publisher.

WARD, William Hayes, South Berwick, Me., Aug. 28, aged 81; late editor of the *Independent*, archæologist.

WARNER, William, Kansas City, Mo., Oct. 4, aged 76; Senator from Missouri, 1905-11.

WATERS, Nacy McGee, New York, May 12, aged 49; Congregational clergyman.

WEBSTER, Alice Jean (Mrs. Glenn Ford McKinney), New York, June 10, aged 39; novelist.

WEBSTER, Francis Marion, Columbus, O., Jan. 3, aged 66; entomologist.

WELLS, Webster, Boston, May 23, aged 64; late professor of mathematics in Massachusetts Institute of Technology.

WERNER, William E., Rochester, N. Y., March 1, aged 60; justice of the New York Court of Appeals.

WHITE, Horace, New York, Sept. 16, aged 82; late editor of the New York *Evening Post*, author.

WHITE, James Clarke, Boston, Jan. 6, aged 82; dermatologist.

WHITE, James William, Philadelphia, April 24, aged 65; surgeon.

WHITRIDGE, Frederick Wallingford, New York, Dec. 30, aged 64; lawyer and financier.

WHITTEMORE, Don Juan, Milwaukee, July 17, aged 85; civil engineer.

WHITTEMORE, James Madison, Jamestown, R. I., Sept. 6, aged 80; brigadier-general, U. S. A., retired.

WILSON, Alpheus Waters, Baltimore, Nov. 21, aged 82; bishop of the Methodist Episcopal Church, South.

WILSON, Robert Burns, New York, March 31, aged 64; painter and poet.

WOLF, Henry, New York, March 18, aged 63; wood engraver.

WOODS, Matthew, Philadelphia, Oct. 13, aged 67; physician.

WOODWARD, George A., Washington, Dec. 22, aged 81; brigadier-general, U. S. A., retired.

WOODWARD, Julius Hayden, New York, July 2, aged 58; physician.

WYATT, Francis, Forest Hills, N. Y., Feb. 27, aged 61; chemist.

FOREIGN NECROLOGY

AUBREY, William Hickman Smith, Croydon, England, Feb. 10, aged 62; English journalist and author.

AVARNA, Duke of, Rome, April 1, Italian diplomat.

BALLET, Gilbert, Paris, March 17; neurologist.

BARBERENA, Santiago Ignacio, San Salvador, Nov. 28, aged 73; astronomer.

BOYLE, (Sir) Cavendish, London, Sept. 17, aged 77; Governor of Newfoundland, 1901-4.

BROOKE, Stopford Augustus, Ewhurst, England, March 18, aged 83; author.

BRUNTON, (Sir) Thomas Lauder, London, Sept. 16, aged 72; physician.

BUGATTI, Rembrandt, Paris, Jan. 9; sculptor.

CARR, Joseph William Comyns, London, Dec. 13, aged 67; critic and dramatist.

CASGRAIN, Thomas Chase, Ottawa, Dec. 29, aged 64; Postmaster-General of Canada.

COLLIN, Raphael, Paris, Oct. 21, aged 66; painter.

"DANBY, Frank" (Mrs. Julia Frankau), London, March 17, aged 52; novelist.

DARIO, Ruben, Leon, Nicaragua, Feb. 6; Nicaraguan diplomat, author.

DEDEKIND, J. Wilhelm Richard, Brunswick, Germany, Feb. 12, aged 83; mathematician.

DE VOGUE, Charles Jean Melchior, Marquis, Paris, Nov. 10, aged 87; diplomatist and author.

DOYEN, Eugene Louis, Paris, Nov. 21, aged 56; French surgeon.

ECHEGARAY, José, Madrid, Sept. 15, aged 83; Spanish dramatist and statesman.

ELIZABETH, Dowager Queen of Rumania ("Carmen Sylva"), Bucharest, March 2, aged 72.

FAGUET, Emile, Paris, June 7, aged 68; author.

FILIPESCU, Nicola, Bucharest, Oct. 13; Rumanian statesman.

FRANZ JOSEF, Emperor of Austria and King of Hungary, Vienna, Nov. 21, aged 86.

GALLIENI, Joseph Simeon, Versailles, May 27, aged 67; French general, Minister of War, 1915-6.

GOERGEI, Arthur, Budapest, May 21, aged 98; Hungarian general.

GOLTZ, Baron Kolmar von der, at the front in Asia Minor, April 19, aged 72; German field marshal commanding the First Turkish Army.

GOMME, (Sir) George Laurence, Long Crendon, England, Feb. 24, aged 62; anthropologist and antiquarian.

GORST, (Sir) Eldon, London, April 4, aged 81; British statesman.

GOWER, Lord Ronald Sutherland, Tunbridge Wells, England, March 9, aged 81; sculptor and author.

GRANADOS, Enrique, at sea from the *Sussex*, March 24; Spanish composer.

HARPIGNIES, Henri Joseph, St. Prive, France, Aug. 28, aged 97; painter.

HORSLEY, (Sir) Victor Alexander Haden, Amara, Mesopotamia, July 16, aged 59; surgeon.

HUERTA, Victoriano, El Paso, Tex., Jan. 13, aged 61; President of Mexico, 1913-14.

JAMES, Henry, London, Feb. 28, aged 72; novelist.

KIDD, Benjamin, South Croydon, England, Oct. 2, aged 58; sociologist.

KING, William Frederick, Ottawa, April 23, aged 62; astronomer.

KITCHENER, Horatio Herbert, Earl, at sea, June 5, aged 65; British general, Secretary of State for War.

LEROY-BEAULIEU, Pierre-Paul, Paris, Dec. 10, aged 73; economist.

LINTON, (Sir) James Dromgole, London, Oct. 3, aged 75; painter.

LOVELL, (Sir) Francis Henry, London, Jan. 28; dean of the London School of Tropical Medicine.

MARKHAM, (Sir) Clements Robert, London, Jan. 30, aged 85; explorer.

MARTIN, (Sir) George Clement, London, Feb. 23, aged 71; organist and composer.

MASPERO, Gaston Camille Charles, Paris, June 30, aged 70; Egyptologist.

MAXIM, (Sir) Hiram Stevens, London, Nov. 24, aged 76; inventor.

MERCIÉ, Jean Marino Antonin, Paris, Dec. 14, aged 71; sculptor and painter.

METCHNIKOFF, Elie, Paris, July 15, aged 71; bacteriologist.

MOLTKE, Helmuth von, Berlin, June 18, aged 66; German general, late Chief of the General Staff.

MORLEY, Arnold, London, Jan. 17, aged 66; Postmaster-General of Great Britain, 1892-5.

MOUNET-SULLY, Jean, Paris, March 3, aged 75; French actor.

OTTO, deposed King of Bavaria, Munich, Oct. 12, aged 68.

OYAMA, Prince Iwao, Tokio, Dec. 10, aged 74; Japanese field marshal.

PETROVITCH, Ivan Pavloff, Petrograd, Feb. 11, aged 67; surgeon and physiologist.

POHL, Hugo von, Berlin, Feb. 24, aged 60; German admiral.

PORTELLA, Epifanio, Rome, April 11; Minister to the United States from Argentina, 1905-11.

RAMSAY, (Sir) William, Hazlemere, England, July 23, aged 63; chemist.

RASPUTIN, Gregory, Petrograd, Dec. 30; Russian monk and mystic.

REDESDALE, Algernon Bertram Freeman-Mitford, Baron, London, Aug. 17, aged 79; statesman and author.

REGER, Max, Leipsic, May 12, aged 43; composer.

RIBOT, Theodule Armand, Paris, Dec. 9, aged 77; French philosopher.

RICHTER, Hans, Bayreuth, Dec. 6, aged 73; operatic conductor.

RIESCO, Jermain, Santiago, Chile, Dec. 8, aged 61; President of Chile, 1901-6.

ST. ALDWYN, Michael Edward Hicks-Beach, Viscount of, Fairford, England, April 30, aged 79; British statesman.

SALVINI, Tommaso, Florence, Jan. 1, aged 87; Italian actor.

SCOTT-MONCRIEFF, (Sir) Colin Campbell, London, April 6, aged 79; irrigation engineer.

SEGUR, Pierre Marie Maurice Henri, Marquis de, Paris, Aug. 14, aged 63; historian.

SIENKIEWICZ, Henryk, Vevey, Switzerland, Nov. 15, aged 71; Polish novelist.

STRAUSS, Eduard, Vienna, Dec. 29, aged 81; composer.

STUERGKH, Count Karl, Vienna, Oct. 21, aged 57; Premier of Austria since 1911.

THEDENAT, Henri, Paris, Oct. 30, aged 72; archæologist.

THOMPSON, Silvanus Phillips, London, June 13, aged 65; physicist and electrical engineer.

TOSTI, (Sir) Francesco Paolo, Rome, Dec. 3, aged 69; Italian composer.

TURNER, (Sir) William, Edinburgh, Feb. 15, aged 83; surgeon, principal of Edinburgh University.

VERHAEREN, Emile, Rouen, France, Nov. 27, aged 61; Belgian poet.

WARD, Wilfrid Philip, London, April 9, aged 60; editor of the *Dublin Review*.

WILSON, (Sir) Charles Rivers, London, Feb. 9, aged 85; president of the Grand Trunk Railway of Canada.

YUAN SHIH-KAI, Peking, June 6, aged 57; President of the Chinese Republic.

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